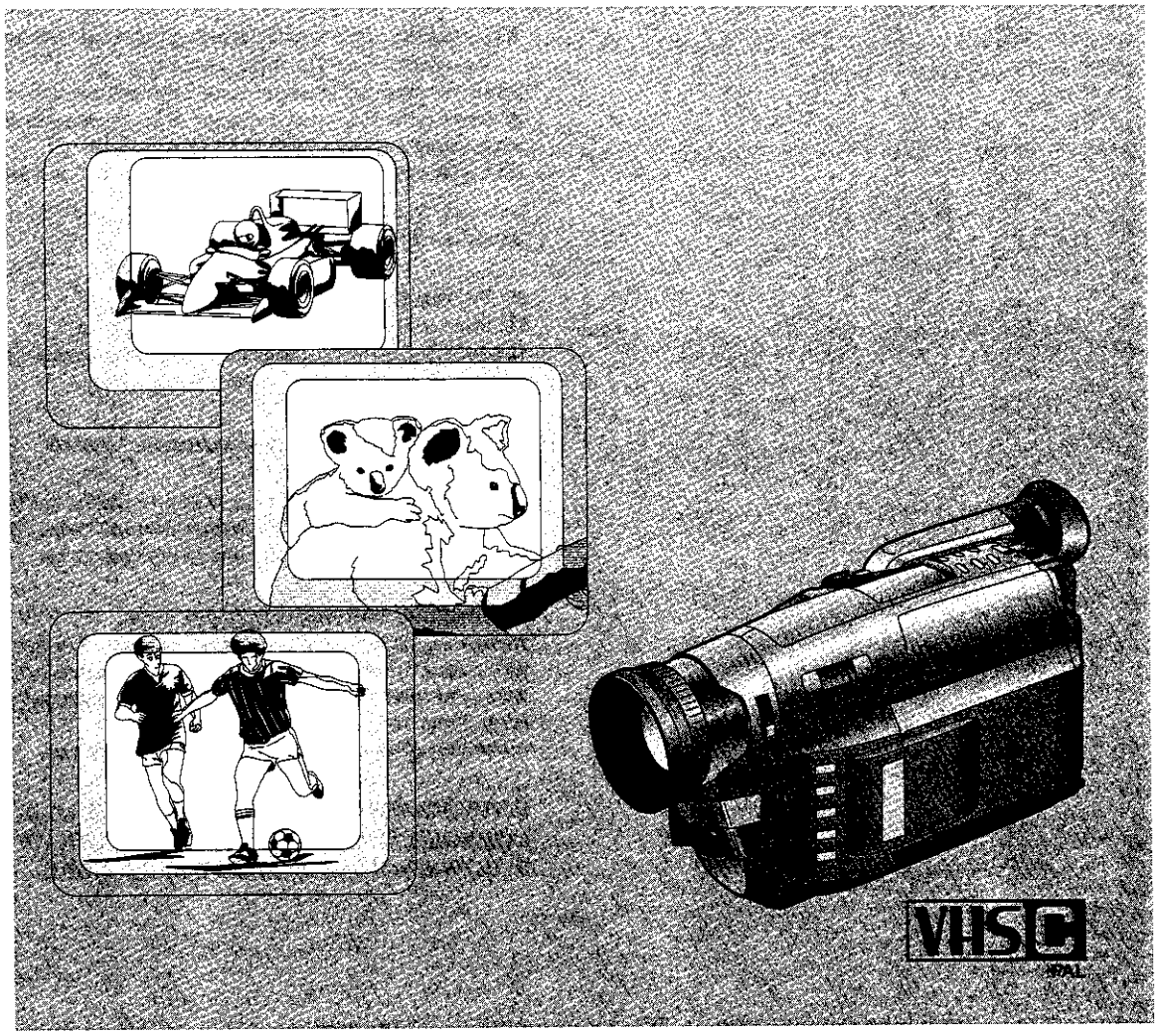
Panasonic

VHS-C Movie Camera
Operating Instructions

Model No. NV-VX37
NV-VX57



Before use, please read these instructions completely.

VQT8038-1

Information for Your Safety

WARNING

To reduce the risk of fire or shock hazard and annoying interference, use only the recommended accessories and do not expose this equipment to rain or moisture.
Do not remove the cover (or back); there are no user serviceable parts inside. Refer servicing to qualified service personnel.

Movie Camera

The rating plate is on the underside of the Movie Camera.

AC Adaptor

The rating plate is on the underside of the AC Adaptor.

As this equipment gets hot during use, operate it in a well ventilated place; do not install this equipment in a confined space such as a book case or similar unit.

■ Carefully read the Operating Instructions and use the Movie Camera correctly.

Injury or material damage resulting from any kind of use that is not in accordance with the operating procedures explained in these Operating Instructions are the sole responsibility of the user.

In these Operating Instructions, the illustrations show the model NV-VX57A.

■ Try out the Movie Camera.

Be sure to try out the Movie Camera before recording your first important event and check that it records properly and functions correctly.

■ The manufacturer is not liable for loss of recorded contents.

The manufacturer shall in no event be liable for the loss of recordings due to malfunction or defect of this Movie Camera, its accessories or cassettes.

■ Carefully observe copyright laws.

Recording of pre-recorded tapes or discs or other published or broadcast material for purposes other than your own private use may infringe copyright laws. Even for the purpose of private use, recording of certain material may be restricted.

IF THE POWER CORD OF THIS EQUIPMENT IS DAMAGED, IT MUST BE REPLACED WITH AN ELECTRICALLY APPROVED POWER CORD.

Contents

If you want to start using the Movie Camera immediately, be sure to read at least the pages marked with ♠.

Preparations

Standard Accessories **6**
Controls and Components **7**
♠ **The 3 Types of Power Supplies** **10**
- Using the AC Adaptor as Power Supply Unit 10
- Charging the Battery 11
- Attaching the Charged Battery 13

Using the LCD Monitor **15**
Using the Menus **16**
- Using the Main Menus 16
- Using the Title Menu 17

Menu Functions **18**
- Main Menus 18
- Title Menu 20

Adjusting the LCD Monitor **21**
♠ **Inserting the Cassette** **22**
- Selecting the Recording Speed 23
- Selecting the Correct Tape Length 23
- Confirming the Remaining Tape Time 24

Adjusting the Finder **25**
Adjusting the Grip Belt **25**
Handling the Lens Cap **25**
Attaching the Shoulder Strap **26**
Setting the Date and Time **27**
- Recording with the Time and/or Date Superimposed in the Picture 28
- Charging the Built-in Lithium Battery 29

Basic Operations

♠ **Recording in the Full Auto Mode** **30**
Checking the End of a Recorded Scene (Recording Check Function) **32**
- Searching for a Tape Position Before the End of the Last Recording (Camera Search Function) 32

Zooming In/Out **33**
- Using the Macro Close-up Function 34

♠ **Playback** **35**
- Watching Playback on the Movie Camera 35
- TBC (Time Base Corrector) Function 36
- Watching Playback on the LCD Monitor with the Movie Camera Placed on a Table 37
- Watching the Picture on a TV 38
- Playing Back on a VCR (Using the Supplied Cassette Adaptor) 39
- Fast-Forwarding 40
- Rewinding 40
- Eliminating Picture Distortions (Tracking Adjustment) 40
- Cue Playback 41
- Review Playback 41
- Still Playback 41

After Use **42**
- Cleaning the Finder 42
- Cleaning the LCD Monitor 42
- Cleaning the Movie Camera Body 42
- Cleaning the Lens 42

Advanced Operations

Using the Power Save Functions 43
- Using the Auto Power Save Function 43
- Using the Anti-Ground Recording Function 44

Fading In/Out 45
Recording a Still Picture (Snapshot Recording) 46
Using Special Effects (Digital Effects) 47
- Selecting a Desired Digital Effect 47
- Digital Effects 1 [EFFECT1] 48
- Digital Effects 2 [EFFECT2] 50
- Using the Super Image Stabilizer Function 51
- Using the Digital Zoom Function 52
- Displaying 9 Small Still Pictures on the Screen (Multi Image) 53
- Displaying a Small Still Picture Inside the Normal Picture (Picture-in-Picture) 55
- Mix Function 56
- Wipe Function 57
- Digital Fade 58

Motion-Sensor-Controlled Recording 59
Recording in Dark Places Without Any Illumination (0 Lux Night View Function) 61
- Using the 0 Lux Night View Function together with the Motion-Sensor-Controlled Recording Function in Dark Places without Any Illumination 62

Subjects and Recording Conditions for Which the Manual Mode Is More Suitable 63
Recording with Manual White Balance Adjustment 64
- Colour Temperature and White Balance Adjustment 65

Recording with Manual Focus Adjustment 66
Recording in Special Situations (Programme AE) 67
Recording Backlit Scenes (Backlight Mode) 69

Advanced Operations

Using the Remote Controller 70
- Inserting the Batteries into the Remote Controller 71

Recording Yourself with the LCD Monitor Facing Forward 72

Recording with Pre-programmed Titles Inserted in the Picture 74
- Selecting the Desired Language 74
- Selecting the Desired Pre-programmed Title 75
- Selecting the Desired Colour of the Pre-programmed Title 75
- Selecting the Size of the Pre-programmed Title 76

Creating Your Own Titles and Inserting Them During Recording (Digital Superimposer Function) 77
- Storing Your Own Title in the Digital Image Memory 77
- Selecting the Desired Colour of Your Own Title 78
- Inserting Your Own Title at the Beginning of a Recording 79
- Inserting Your Own Title During Recording 79

Using Various Functions during Playback 80
- Playback Title Indication 80
- Playback Digital Fade 81
- Playback Digital Superimposer 82

Using the Tape Counter Indication 83
- Checking the Elapsed Tape Time 83
- Using the Memory Stop Function 85

Dubbing (Copying) 86

Precautions, Technical Information, etc.

Precautions 87
- Precautions for the Movie Camera 87
- Precautions for the AC Adaptor 87
- Precautions for the Battery 88
- Precautions for the Cassette 88
- Causes of Condensation and Remedy 89
- Video Head Clogging and Remedy 89

How the White Balance (Tint) Adjustment Works 90

How the Focus Adjustment Works 91

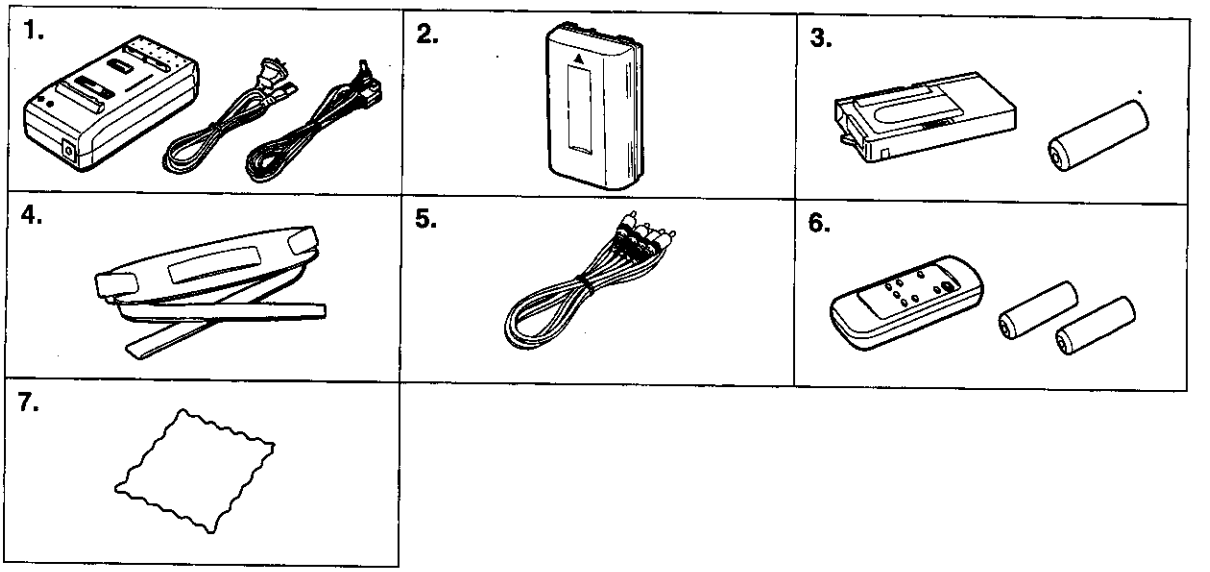
Indications 93

Demonstration Mode 96

Optional Accessories 97

Specifications 98

Before Requesting Service (Problems & Solutions) 99



Preparations

This chapter explains the necessary steps before you can start using the Movie Camera.

Standard Accessories

1. **AC Adaptor (➔ 10, 11, 29, 87)**

   To supply power to the Movie Camera and to charge the Battery.

   DC Input Cable and AC Mains Cable (➔ 10, 11)

   To connect the AC Adaptor to the Movie Camera and to an AC mains socket.

2. **Battery (➔ 11, 13, 88)**

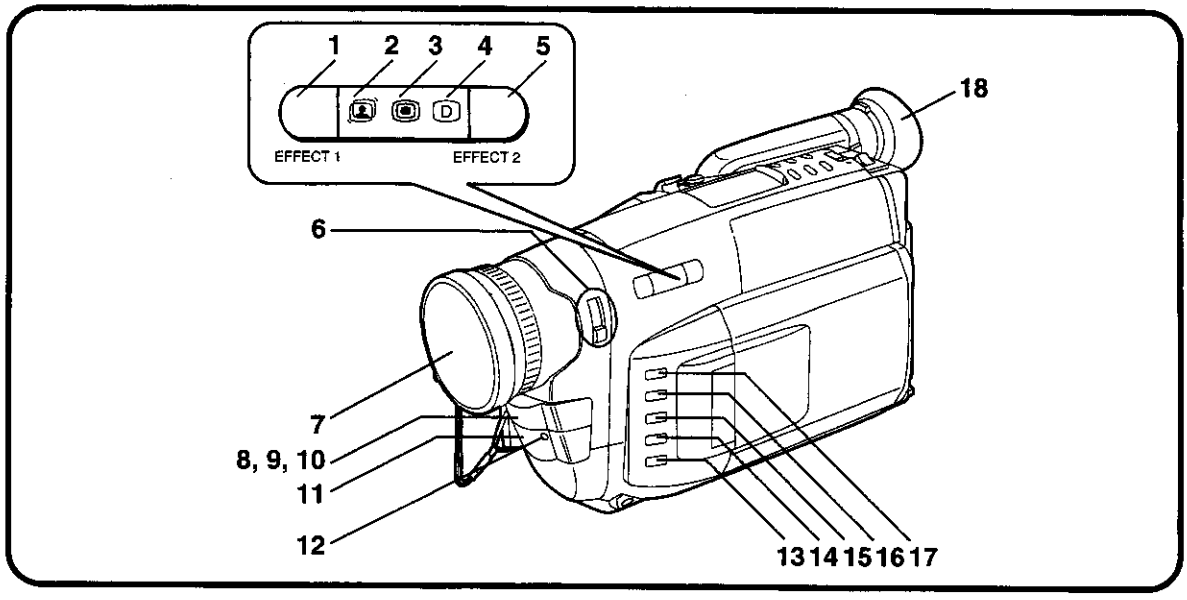
   To supply power to the Movie Camera.

3. **Cassette Adaptor and Battery (➔ 39)**
4. **Shoulder Strap (➔ 26)**
5. **AV Cable (➔ 38, 86)**

   To connect the Movie Camera to the Video Input and Audio Input Sockets on a TV or a VCR.

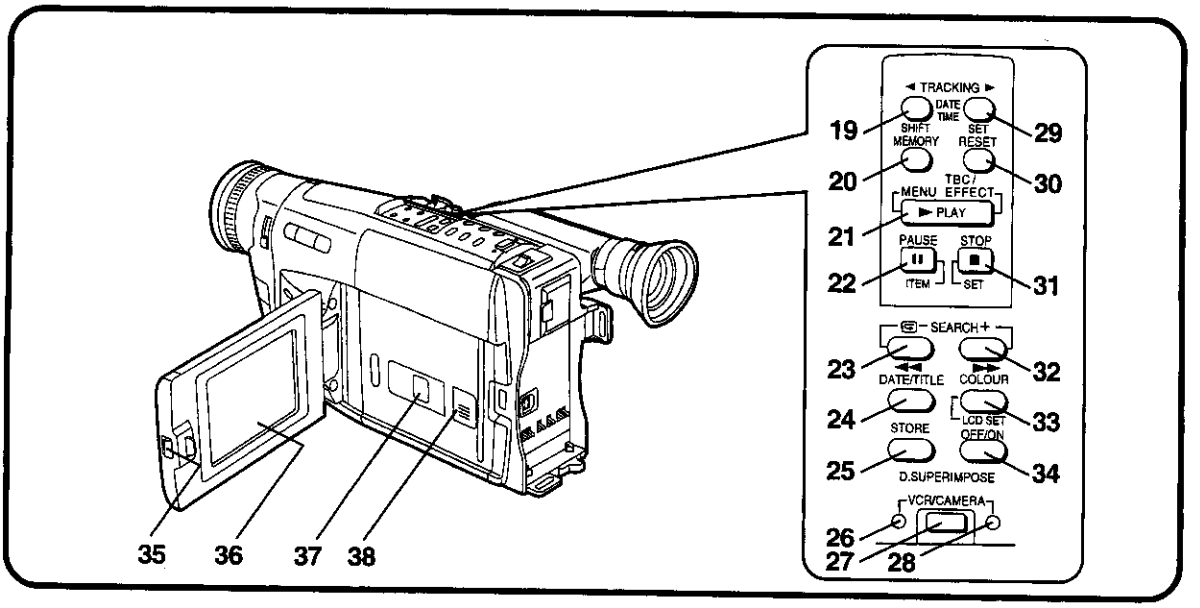
6. **Remote Controller and Batteries for Remote Controller (➔ 70, 71)**
7. **Cleaning Tissue (➔ 42)**

   To clean the Lens and LCD Monitor.



Controls and Components

1 Digital Effect 1 Button [EFFECT1] (➜ 47)
2 Super Image Stabilizer Indication Lamp [ ] (➜ 51)
3 Digital Zoom Indication Lamp [ ] (➜ 52)
4 Digital Effect Indication Lamp [D] (➜ 53)
5 Digital Effect 2 Button [EFFECT2] (➜ 47)
6 0-Lux Recording Switch [0 LUX ON/OFF] (➜ 61, 62)
7 Lens Cap (➜ 25, 64)
8 White Balance Sensor (➜ 90)
9 Remote Control Sensor (➜ 70)
10 Built-in Infra red Beam Emitters (➜ 61)
11 Microphone
12 Tally Lamp (➜ 30)
13 Focus Button [FOCUS] (➜ 66)
14 White Balance Button [W.B] (➜ 64)
15 Fade Button [FADE] (➜ 45, 58, 81)
16 Backlight Button [BACKLIGHT] (➜ 69)
17 Auto Exposure Selector Button [PROGRAMME AE] (➜ 30, 64, 66, 67)
18 Eyecup



19 Date/Time Shift Button [DATE/TIME/SHIFT] (➔ 27)
Tracking Button [◄ TRACKING] (➔ 40)

20 Memory Button [MEMORY] (➔ 83, 85)

21 Playback Button [PLAY] (➔ 35)
Menu Button [MENU] (➔ 16, 17)
TBC Button [TBC] (➔ 36)
Effect Button [EFFECT] (➔ 80)

22 Pause Button [PAUSE] (➔ 41)
Item Selector Button [ITEM] (➔ 16, 17, 21)

23 Reverse Search Button [−SEARCH] (➔ 32)
Rewind/Review Button [◄◄] (➔ 40, 41)
Recording Check Button [⟲] (➔ 32)
LCD Adjustment Button [◄◄] (➔ 21)

24 Date/Time/Title Button [DATE/TITLE] (➔ 27, 28, 76, 80)

25 Digital Image Store Button [STORE] (➔ 77, 82)

26 VCR Mode Lamp [VCR] (➔ 35)

27 VCR/Camera Mode Selector Button [VCR/CAMERA] (➔ 35)

28 Camera Mode Lamp [CAMERA] (➔ 30)

29 Date/Time Set Button [DATE/TIME/SET] (➔ 27)
Tracking Button [TRACKING ►] (➔ 40)

30 Tape Counter Reset Button [RESET] (➔ 83, 85)

31 Stop Button [STOP] (➔ 35)
Item Set Button [SET] (➔ 16, 17)

32 Forward Search Button [SEARCH+] (➔ 32)
Fast Forward/Cue Button [►►] (➔ 40, 41)
LCD Adjustment Button [►►] (➔ 21)

33 Colour Selector Button for Digital Image [COLOUR] (➔ 78, 82)
LCD Set Menu Display Button [LCD SET] (➔ 21)

34 Digital Image Superimpose Button [OFF/ON] (➔ 77, 78, 79)

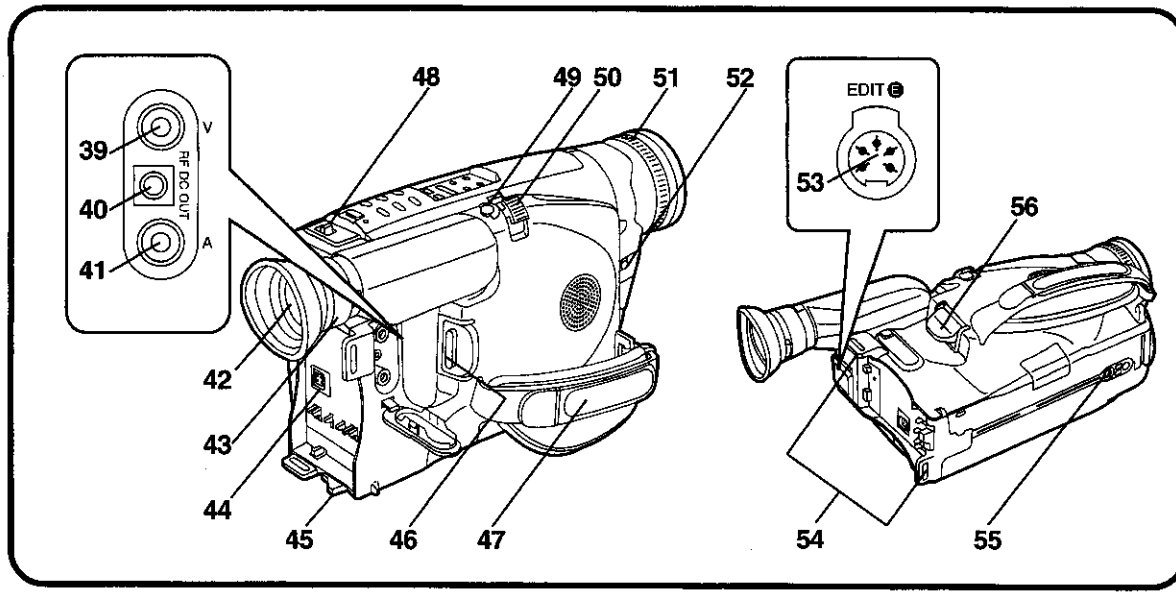
35 LCD Monitor Open Lever [▲OPEN] (➔ 15)

36 LCD Monitor (➔ 15, 21, 42)

> Due to limitations in LCD production technology, there may be some tiny bright or dark spots on the LCD Monitor screen. However, this is not a malfunction and does not affect the recorded picture.

37 Cassette Compartment (➔ 22)

38 Cassette Compartment Lock Button [LOCK] (➔ 22)



39 Video Output Socket [V] (➜ 38, 86)

40 Radio Frequency DC Output Socket [RF DC OUT] (➜ 38)

41 Audio Output Socket [A] (➜ 38, 86)

42 Finder (➜ 25, 42)

43 Eyepiece Corrector Ring (➜ 25)

44 DC Input Socket [DC IN] (➜ 10)

45 Battery Eject Lever [BATTERY EJECT] (➜ 13)

46 Recording Start/Stop Button (➜ 30)

47 Grip Belt (➜ 25)

48 Cassette Eject Lever [⏏ EJECT] (➜ 22)

49 Snapshot Recording Button [SNAP] (➜ 46)
Multi Image/Picture-in-Picture Button [MULTI] (➜ 53, 54, 55)

50 Zoom Lever [W•T] (➜ 33, 34, 52)
Volume Adjustment Lever [−VOL+] (➜ 35)

51 Focus Ring (➜ 66)

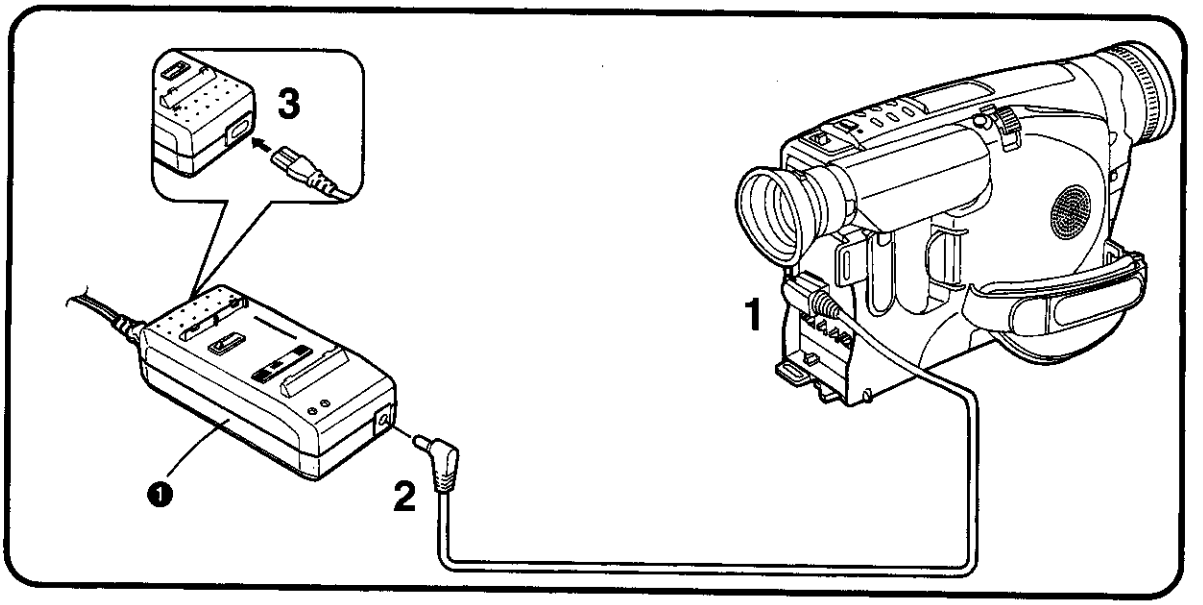
52 Microphone Socket [MIC]

53 Edit Socket [EDIT ⊜] (➜ 86)

54 Shoulder Strap Holders (➜ 26)

55 Tripod Receptacle

56 Power Switch [POWER] (➜ 30)



The 3 Types of Power Supplies

To try out the Movie Camera at home, we recommend that you use the AC Adaptor ❶.

1. **AC Adaptor (supplied)**
   - To use the Movie Camera indoors.
   - To charge the Battery. **(→ 11)**
2. **Battery (supplied)**
   - To use the Movie Camera outdoors, and also indoors when there is no AC mains socket nearby. **(→ 11)**
3. **Car Battery Charger (optional)**
   - To use the Movie Camera in a car.

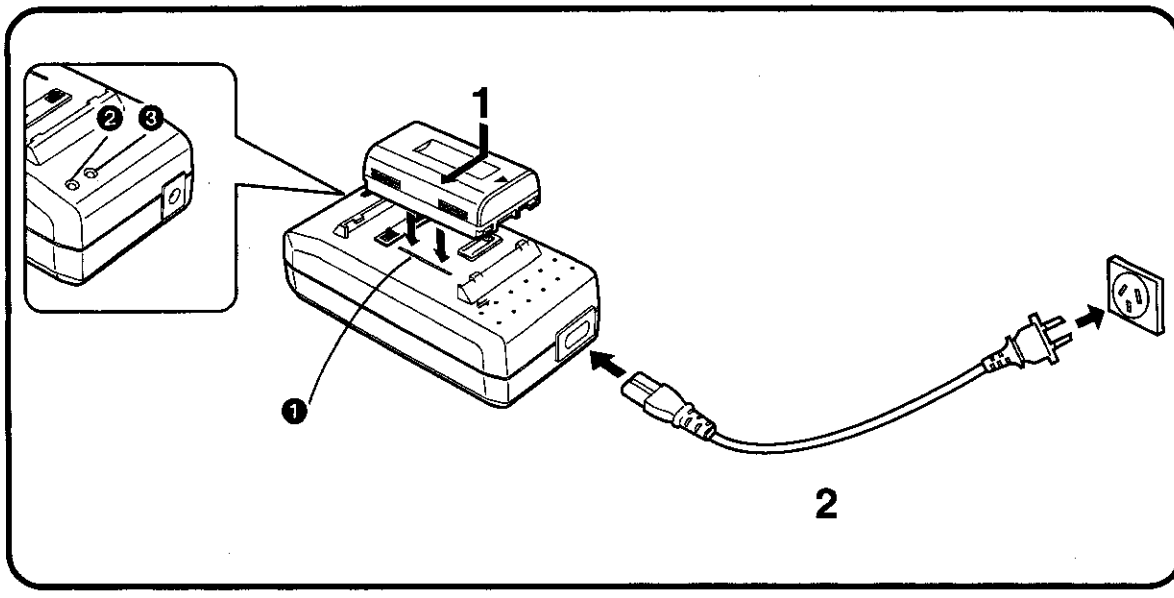
Using the AC Adaptor as Power Supply Unit

1 Connect the DC Input Cable to the [DC IN] Socket on the Movie Camera.

2 Connect the other end of the cable to the [DC OUT] Socket on the AC Adaptor.

3 Connect the AC Mains Cable to the AC Adaptor and to an AC mains socket.

The AC Adaptor features automatic universal voltage adjustment (AC 100–240 V, 50/60 Hz), therefore, there is no need for any manual voltage adjustment for use in other countries.



Charging the Battery

Charge the Battery before using it.

1 Attach the Battery.

- Align the Battery with line ❶ and push it in the direction of the arrow while holding it down.

2 Securely connect the AC Mains Cable to the AC Adaptor and an AC Mains Socket.

- The [POWER] Lamp ❷ lights and then the [CHARGE] Lamp ❸ flashes and charging starts.
- If the [CHARGE] Lamp ❸ does not flash even though the Battery is attached, remove the Battery and then re-attach it.

■ Charging Lamp [CHARGE]

Flashing:	During charging
Lit:	The Battery can already be used to operate the Movie Camera but it is not yet fully charged. (Approx. 30-minute battery charge)
Off:	The Battery is fully charged.

■ Removing the Battery

Slide it in the opposite direction of that indicated in step 1 above.

- Charge the Battery at a room temperature between 10°C and 30°C.
- When charging, do not connect the DC Input Cable to the AC Adaptor.
- During recording and charging, the Battery becomes warm. However, this is normal.
- If you charge the Battery when it is not yet discharged, the [CHARGE] Lamp ❸ may flash briefly and then go out. This indicates that the Battery is fully charged. Therefore, this is not an indication of a malfunction.

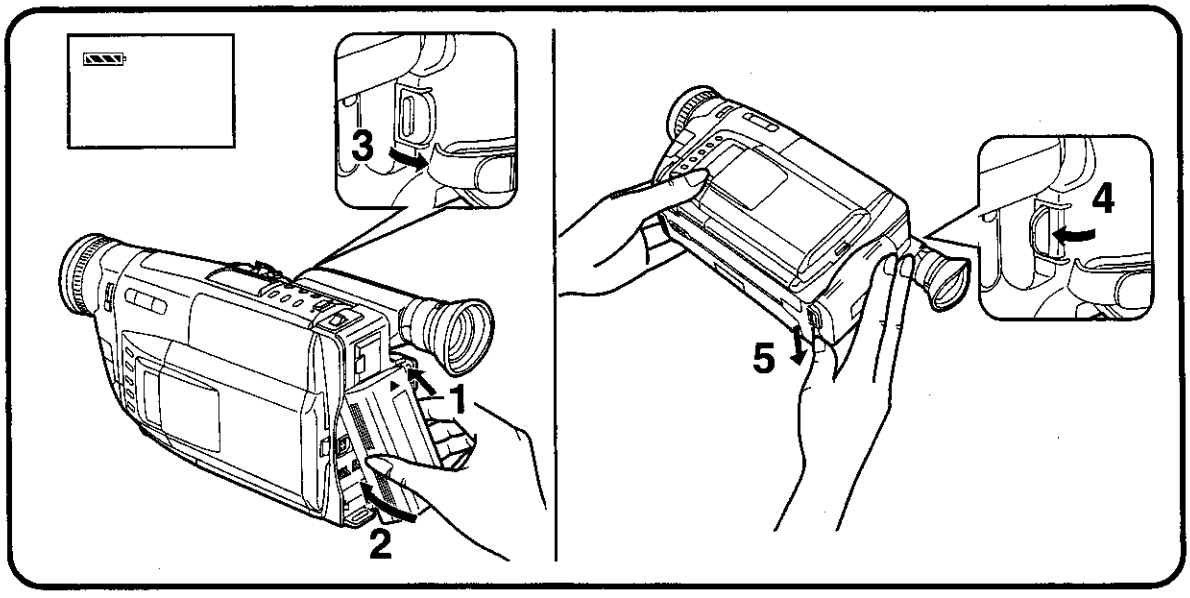
■ Charging Time and Maximum Continuous Recording Time in the Manual Recording Mode

Battery Model No.	Charging Time for a Full Charge	Max. Continuous Recording Time	
		①	②
CGR-V610 (Supplied)	80 min.	85 min.	105 min.
CGR-V620	145 min.	170 min.	225 min.
CGR-V816	310 min.	340 min.	440 min.

Battery Model No.	Approx. 30-Minute Charge	Max. Continuous Recording Time	
		①	②
CGR-V610 (Supplied)	30 min.	35 min.	45 min.
CGR-V620			
CGR-V816			

① Using LCD Monitor ② Using Finder
(The times shown in the above charts are approximations.)

Maximum Continuous Recording Time means the duration of continuous recording performed at an ambient temperature of 25°C and 60% relative humidity. In actual recording, however, the use of the zoom and other functions increases the power consumption, and higher or lower temperature reduces the Battery's ability to generate electricity. Therefore, the actual recording time per Battery may be approximately 30%–50% shorter than listed above.



Attaching the Charged Battery

1 **Insert the Battery with its top (so that the arrow points upward) into the top Battery Holder.**

2 **Press the bottom of the Battery toward the Movie Camera until it locks with a click.**

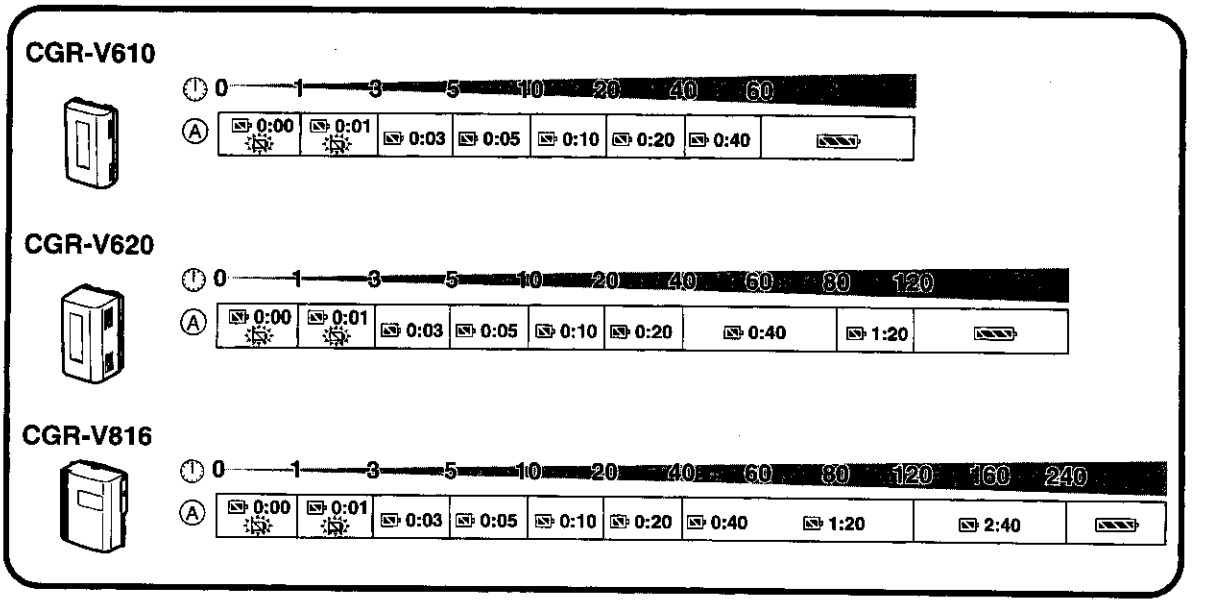
3 **Turn out the [POWER] Switch to turn the Movie Camera on.**

- The remaining battery operation time can be confirmed both in the Finder and on the LCD Monitor.
- To ensure more precise indication of the remaining battery power, attach a fully charged Battery.
- For details about the Remaining Battery Power Indication, read "Checking the Remaining Battery Power". **(➔ 14)**

■ Removing the Battery

4 **Turn in the [POWER] Switch to turn the Movie Camera off.**

5 **Hold the Battery firmly to prevent it from dropping and pull it off while sliding the [BATTERY EJECT] Lever in the direction of the arrow.**



■ Checking the Remaining Battery Power

You can confirm the remaining charge in the attached Battery in the Finder or on the LCD Monitor. This also shows you approximately how much more continuous recording time you can get from the attached Battery. The indicated time does not change in 1-minute steps. The above illustrations show how the Remaining Battery Operation Time Indication changes according to the remaining operation time.

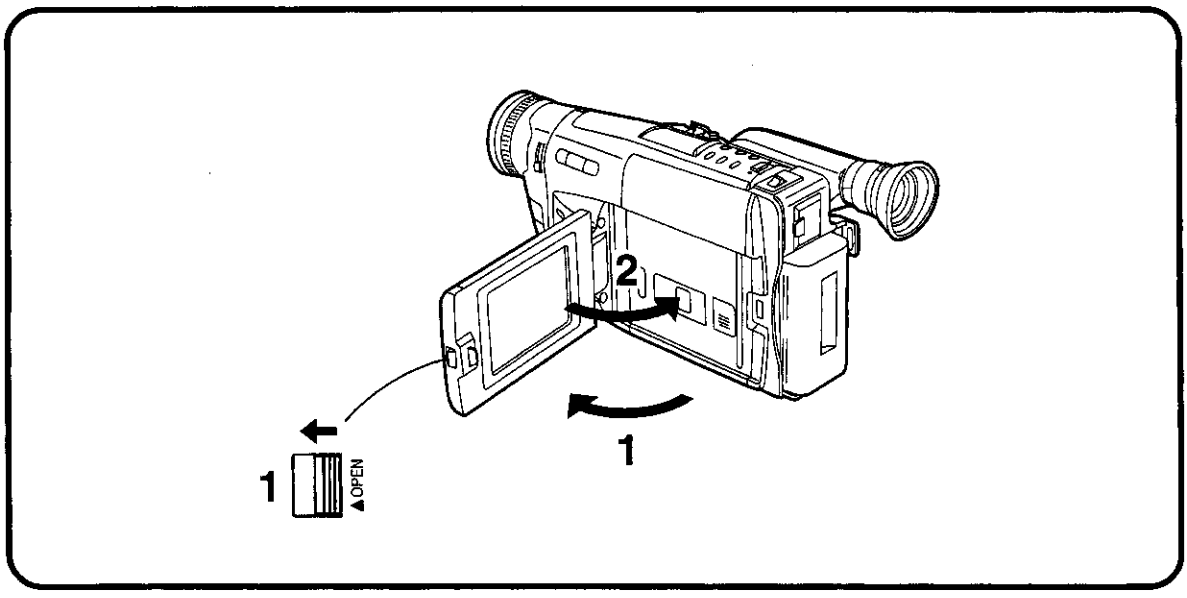
Ⓘ: Remaining Battery Operation Time
Ⓐ: Remaining Battery Operation Time Indication (This indication does not appear when recording in the Mirror Mode.) (➔ 73)

Remaining Battery Operation Time Indication
This Indication shows the remaining duration of continuous recording at an ambient temperature of 25°C when a fully charged Battery was attached.Therefore, in the following cases, the actual available recording time is different from the times shown above:

When Recording Is Not Performed Continuously
In most cases, you will frequently start and stop recording, turn the Movie Camera on and off, use the zoom and other functions, all of which consume power. Therefore, the actual available recording time from the Battery is approximately 30–50% shorter than listed. (➔ 12)

When the Ambient Temperature Is Extremely Low or Extremely High
The characteristics of the Battery vary according to the ambient temperature, and at a very low temperature, the possible recording time becomes extremely short. In addition, the Remaining Battery Operation Time Indication on the Movie Camera decreases a little faster than at an ambient temperature of 25°C.
(At a higher temperature, it tends to decrease more slowly.)

When the Service Life of the Battery Has Reached Its End
When the operation time even after full charging is too short for normal use, the service life of the Battery has reached its end. (➔ 88)



Using the LCD Monitor

Improved LCD backlight transmission makes the picture extra bright. In addition, special coating of the LCD's surface diffuses the light from outside to minimize light reflection, so the picture has vivid colours and is easy to see.

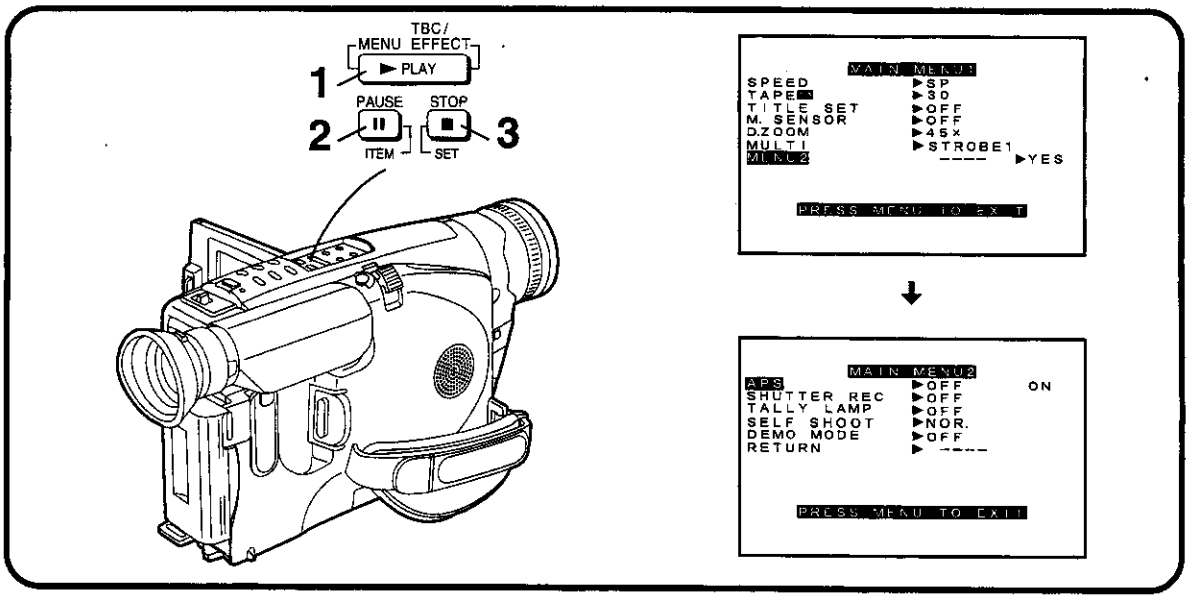
■ Opening the LCD Monitor

1 Slide the [▲OPEN] Lever to the left and simultaneously open the LCD Monitor in the direction of the arrow approximately 90°.

■ Closing the LCD Monitor

2 Turn the LCD Monitor back toward the Movie Camera body until it locks with a click.

- Return the LCD Monitor to its vertical position before closing it, Also, make sure that the Cassette Compartment is securely closed before closing the LCD Monitor.
- Opening the LCD Monitor automatically turns the Finder off. However, when you turn the LCD Monitor so that is faces forward, the Finder turns on again.
- Extremely high precision technology is employed in producing the LCD Monitor. The result is more than 99.99% effective pixels with a mere 0.01% of the pixels inactive or always lit.
  However, this is not a malfunction and does not affect the recorded picture.
- When the Movie Camera is very cold when turning it on, the picture on the LCD Monitor is darker than normally. However, as it reaches normal temperature, it regains its normal brightness.
- To remove fingerprints, wipe the LCD Monitor with the supplied Cleaning Tissue or a similar soft cloth.
- Do not expose the LCD Monitor to direct sunlight. When sunlight falls onto the LCD Monitor, it may be difficult to view the picture.
- Do not apply any pressure to the surface of the LCD Monitor or subject it to strong shocks.
- Before transporting the Movie Camera, securely close the LCD Monitor.



Using the Menus

This Movie Camera displays the settings of various functions in Menus to make it easy to select the desired functions and settings.

Perform the following operations with the Movie Camera in the Camera Mode (the [CAMERA] Lamp lights) and in the Recording Pause Mode.

Using the Main Menus

1 Press the [MENU] Button.

- The [MAIN MENU1] Menu appears.

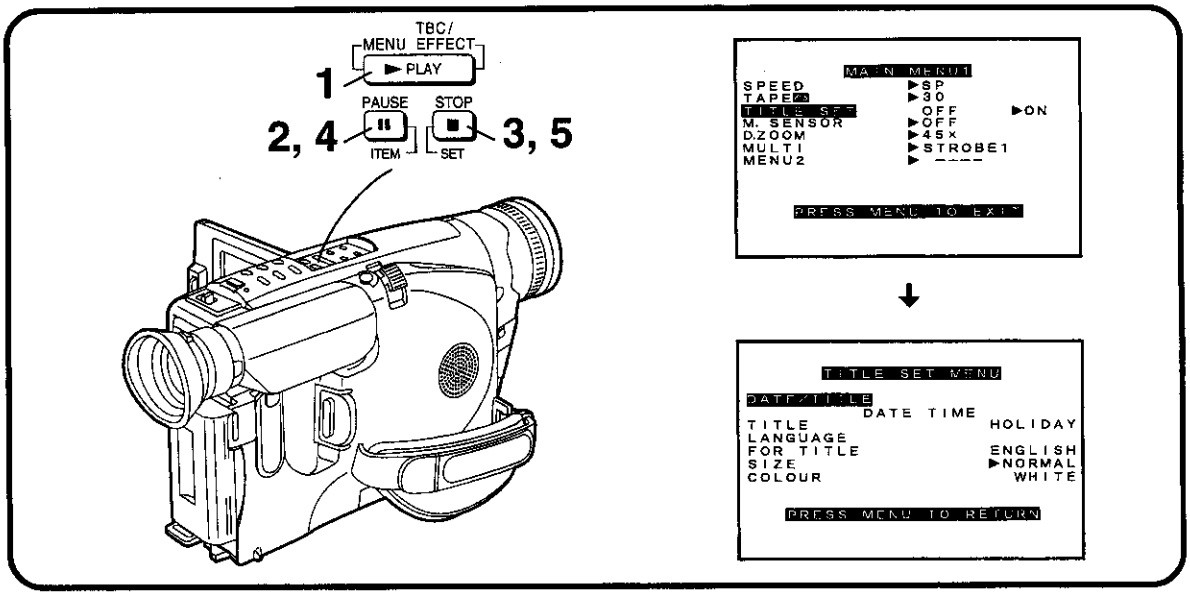
2 Press the [ITEM] Button repeatedly to select the item to be set.

- If you select [MENU2], the [MAIN MENU2] Menu appears.

3 Press the [SET] Button repeatedly to set the desired mode for the selected item.

Exiting the Main Menu(s)

Press the [MENU] Button.



Using the Title Menu

1 Press the [MENU] Button.

- The [MAIN MENU1] Menu appears.

2 Press the [ITEM] Button repeatedly to select [TITLE SET].

3 Press the [SET] Button to set to [ON].

- The [TITLE SET MENU] Menu appears.

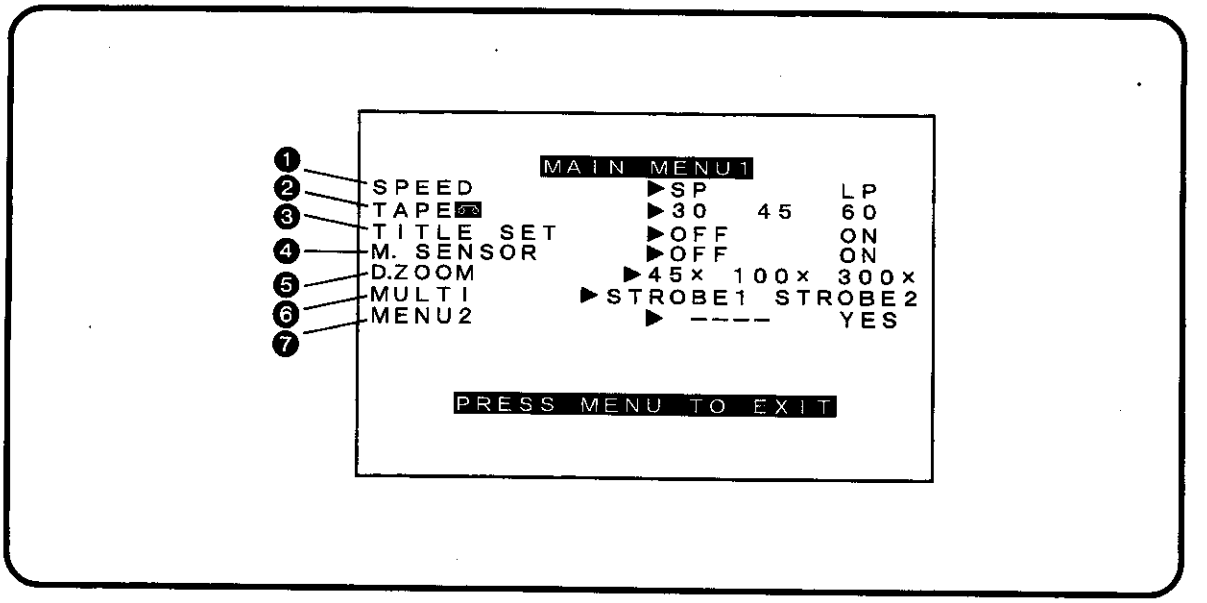
4 Press the [ITEM] Button repeatedly to select the item to be set.

5 Press the [SET] Button repeatedly to set the selected item to the desired mode.

Exiting the Title Menu

Press the [MENU] Button once to return to the [MAIN MENU1] Menu, and then press the [MENU] Button once more to exit the menu.

- The settings that you have selected on the Menus are maintained when you turn the Movie Camera off. However, if you disconnect the power supply unit (Battery or AC Adaptor) from the Movie Camera before turning it off, the selected settings may not be maintained.
- If you connect the Movie Camera to a TV, the Menu can be displayed on the TV screen.



Menu Functions

The illustrations of the menus are for explanation purposes only and the actual menus may be somewhat different.

Main Menus

[MAIN MENU1]

❶ Recording Speed [SPEED] (➜ 23)

To select the recording speed.

❷ Tape Length [TAPE] (➜ 23)

To select the tape length of the cassette being used.

❸ Setting the Title [TITLE SET] (➜ 20)

To change the Menu to the [TITLE SET MENU] Menu, set to [ON].

❹ Motion-Sensor-Controlled Recording [M.SENSOR] (➜ 59)

To turn on the Motion-Sensor-Controlled Recording Function, set to [ON].

❺ Digital Zoom [D.ZOOM] (➜ 52)

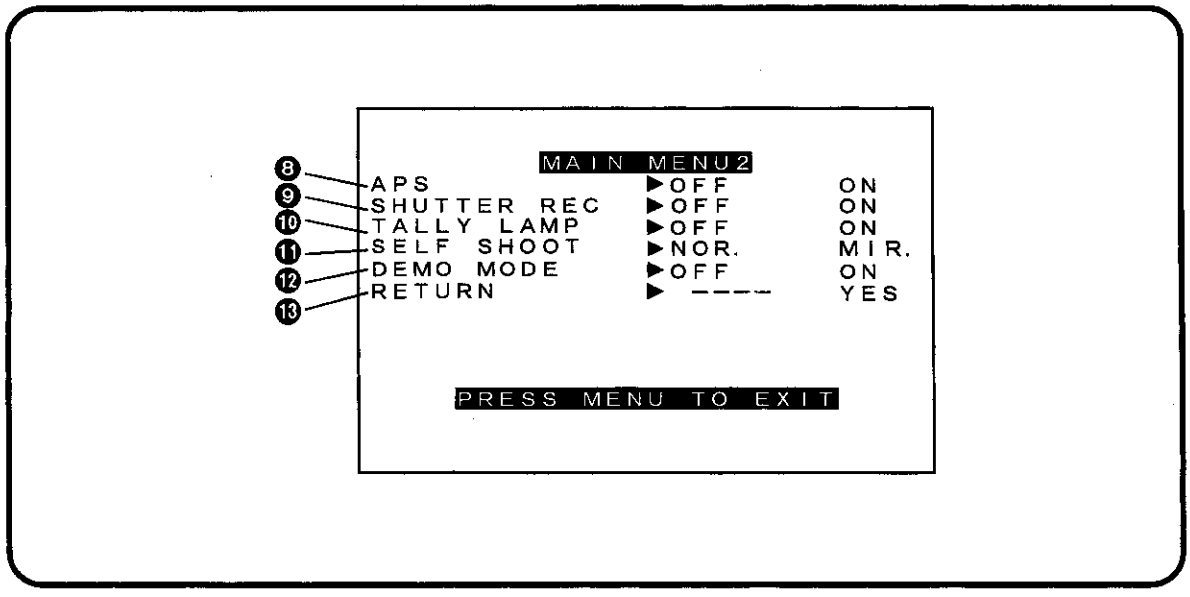
To select the desired digital zoom range.

❻ Multi Image Modes [MULTI] (➜ 53, 54)

To select the desired Multi Image Mode.

❼ Advancing to the Main Menu 2 [MENU2]

To change to the [MAIN MENU2] Menu, set to [YES].



Main Menus (Continued)

[MAIN MENU2]

⑧ Automatic Power Save Functions [APS] (➔ 43)

To turn on the Power Save Functions, set to [ON].

⑨ Shutter Effect [SHUTTER REC] (➔ 46)

To record still pictures in the Snapshot Recording Mode with a visual shutter effect (the screens blinks for an instant), set to [ON].

⑩ Recording Lamp [TALLY LAMP] (➔ 30)

To make the Tally Lamp light during recording, set to [ON].

⑪ Self-Recording [SELF SHOOT] (➔ 72)

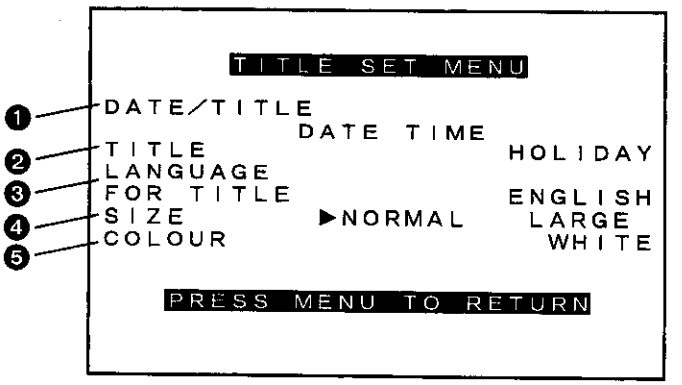
To reverse the picture displayed on the LCD Monitor (Mirror Mode) when recording with the LCD Monitor facing forward, set to [MIR.].

⑫ Demonstration Mode [DEMO MODE] (➔ 96)

To reactivate the cancelled Demonstration Mode, set to [ON].

⑬ Returning to the Main Menu 1 [RETURN]

To change the Menu to the [MAIN MENU1] Menu, set to [YES].



Title Menu

[TITLE SET MENU]

❶ Date/Time/Title Indication [DATE/TITLE] (➜ 28)

To select the desired Date/Time/Title indication.

❷ Title [TITLE] (➜ 75)

To select the desired pre-programmed title.

❸ Language of the Title [LANGUAGE FOR TITLE] (➜ 74)

To select the desired language of the title.

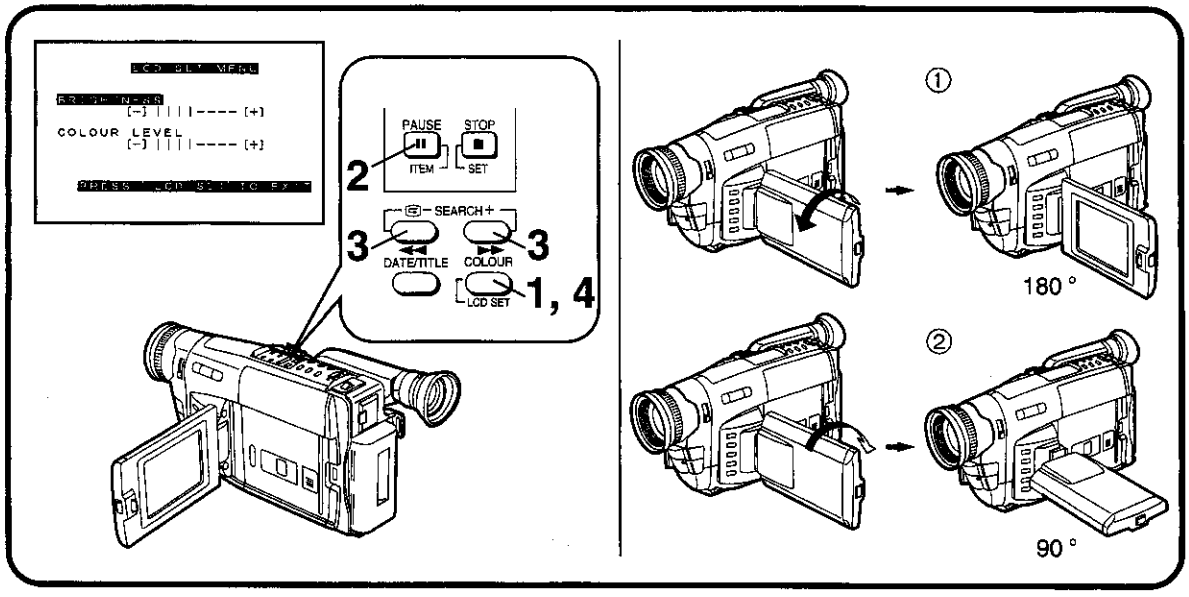
❹ Size of the Title [SIZE] (➜ 76)

To select the desired size of the title.

If you have selected [ARABIC] for [LANGUAGE FOR TITLE], it is not possible to change the size of the title.
When you select [ARABIC], [POSITION] automatically appears instead of [SIZE], [CORNER] instead of [NORMAL] and [CENTER] instead of [LARGE].

❺ Colour of the Date/Time/Title Indication [COLOUR] (➜ 75)

To select the desired colour of the Date/Time/Title Indication.



Adjusting the LCD Monitor

When the picture on the LCD Monitor cannot be seen clearly under certain lighting conditions, you can adjust the brightness and colour level on the menu.

1 Press the [LCD SET] Button.

- The [LCD SET MENU] Menu appears and the following items are displayed:

LCD Brightness [BRIGHTNESS]
To adjust the brightness of the picture on the LCD screen.

LCD Colour Level [COLOUR LEVEL]
To adjust the colour saturation of the picture on the LCD screen.

- When you are using the Digital Superimposer Function, the [LCD SET MENU] Menu does not appear, even if you press the [LCD SET] Button.

2 Press the [ITEM] Button to select the item that you want to adjust.

3 Press the [◀◀] or [▶▶] Button to adjust the number of vertical bars.

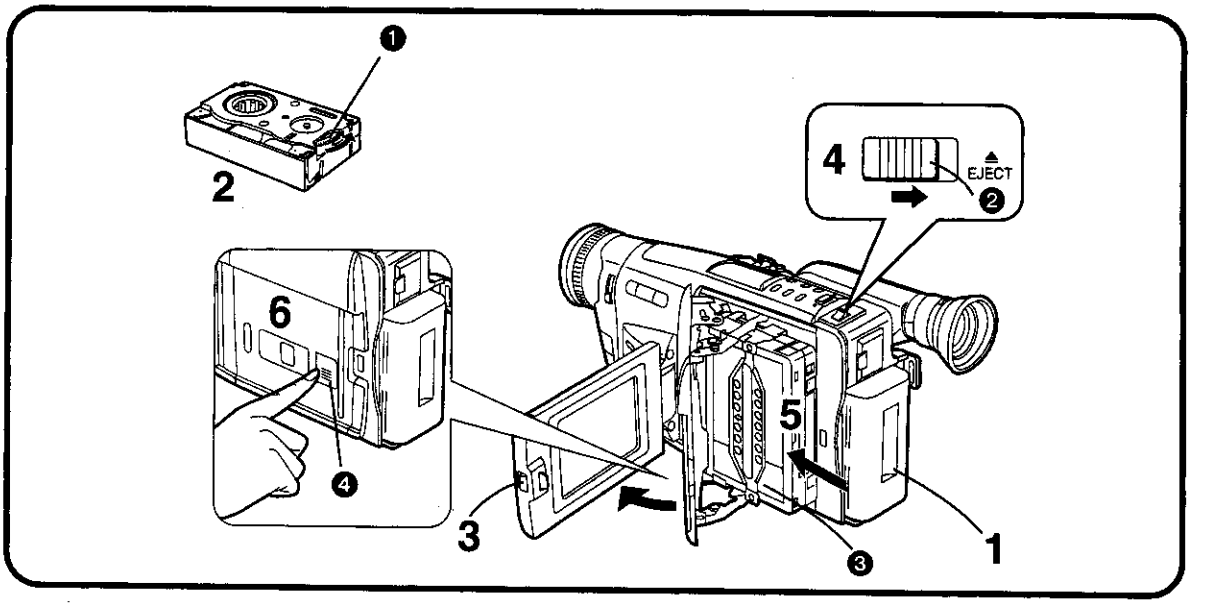
- The Bar Indication is divided into 8 steps. The more vertical bars are shown, the stronger is the brightness or colour saturation.

4 Press the [LCD SET] Button to exit the [LCD SET MENU] Menu.

- These adjustments have no influence on the actually recorded picture.

■ Adjusting the Angle of the LCD Monitor

The LCD Monitor rotates upward a maximum of 180° ① and downward a maximum of 90° ② from its normal vertical position. Trying to forcefully rotate it beyond this range could seriously damage the Movie Camera.



Inserting the Cassette

1 **Connect the AC Adaptor or attach a charged Battery. (➔ 10, 13)**

2 **Turn the cog wheel ❶ to tighten the tape.**

3 **Slide the [▲OPEN] Lever to the left and simultaneously open the LCD Monitor in the direction of the arrow approximately 90°.**

- Be sure to keep the LCD Monitor in its vertical position, so that the Cassette Compartment Cover, when it opens, does not hit the LCD Monitor.

4 **Slide the [⏏ EJECT] Lever ❷ in the direction of the arrow.**

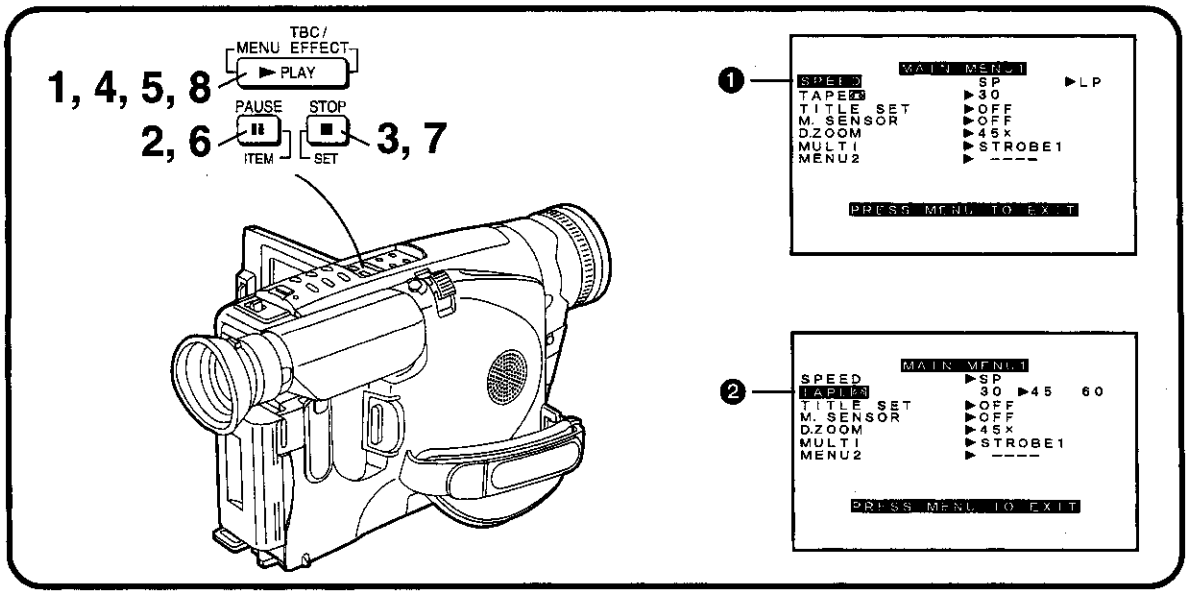
5 **Insert the cassette with the cassette window ❸ facing outward and push it all the way in.**

6 **Close the Cassette Compartment by pressing the [LOCK] Button ❹.**

- It is not possible to take out the cassette during recording.
- Do not insert and take out the cassette repeatedly. This could cause the tape to become loose or damaged.
- If a cassette with broken out erasure prevention tab is inserted, the [⊠] Indication flashes.

Ejecting the Cassette

Slide the [⏏ EJECT] Lever ❷ in the direction of the arrow and pull out the cassette.
Close the Cassette Compartment by pressing the [LOCK] Button ❹.



Selecting the Recording Speed

The desired recording speed can be selected with [SPEED] on the [MAIN MENU1] Menu.

1 Press the [MENU] Button.

- The [MAIN MENU1] Menu appears.

2 Press the [ITEM] Button repeatedly to select [SPEED] ❶.

3 Press the [SET] Button to select the desired recording speed (SP or LP).

- The selected recording speed is marked with the [▶] mark.
- [SP] means Standard Play. [LP] means Long Play.

4 Press the [MENU] Button to exit the menu.

Selecting the Correct Tape Length

To ensure that the Remaining Tape Time Indication displayed during recording and playback is correct, you need to set the tape length that matches that of the inserted cassette.

5 Press the [MENU] Button.

- The [MAIN MENU1] Menu appears.

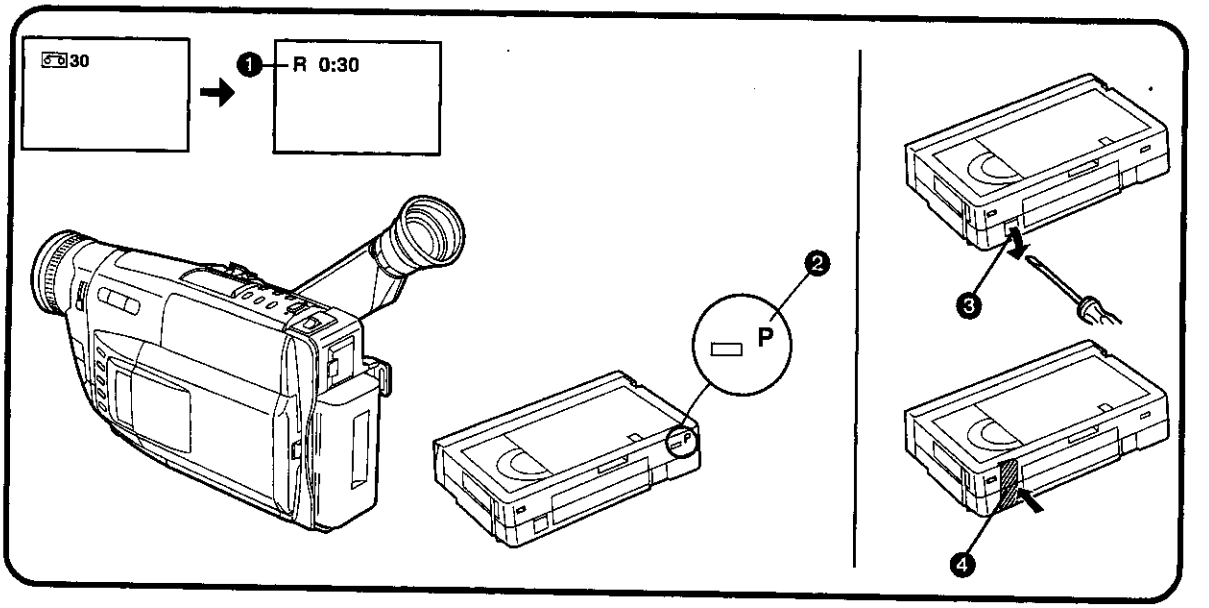
6 Press the [ITEM] Button repeatedly to select [TAPE] ❷.

7 Press the [SET] Button to select the correct tape length.

- The selected tape length is marked with the [▶] Mark.
- The Tape Length Indications change in the following order:

→[30] → [45] → [60] →
[30] [45] [60]

8 Press the [MENU] Button to exit the menu.



Confirming the Remaining Tape Time

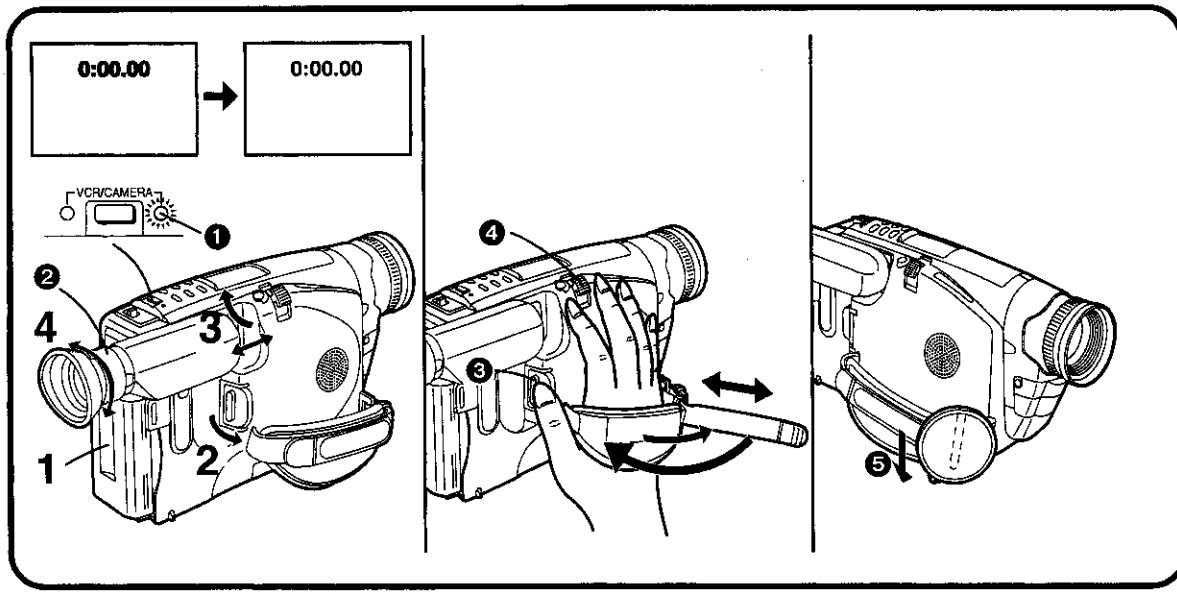
During recording and playback, the Remaining Tape Time Indication ❶ is automatically displayed, so you always know how much time you have left on the cassette. However, to ensure correct display of the remaining tape time, the tape length of the cassette being used must be set correctly on the Movie Camera. (➔ 23)

- When recording or playback starts, the Tape Length Indication disappears, and in its place the [R] Indication flashes while the remaining tape time is being calculated. A few seconds later, the Remaining Tape Time Indication appears. ([R] means Remaining.)
- When the remaining tape time is less than 2 minutes, the [R] Indication and the Remaining Tape Time Indication start to flash.

When you use a cassette bearing the [P] mark ❷ or other special types of cassettes, the Remaining Tape Time Indication may not be very precise.

■ Preventing Accidental Erasure of Recordings

- Recording on a previously recorded cassette erases the existing scenes and sound.
- To protect important recordings against accidental erasure, use a screwdriver to break out the tab ❸ on the cassette (some cassettes have sliding-type tabs).
- To be able to record again on a protected cassette, firmly cover the hole where the tab was with two layers of adhesive tape ❹.



Adjusting the Finder

Before adjusting the Finder, make sure that the LCD Monitor is completely closed.

1 Connect the AC Adaptor or attach a charged Battery.

2 Turn out the [POWER] Switch to turn the Movie Camera on.

- The [CAMERA] Lamp ❶ lights.

3 If necessary, extend the Finder backward and adjust its angle upward.

- The Finder can be tilted upward up to 90°.

4 Look in the Finder and turn the Eyepiece Corrector Ring ❷ clockwise or counterclockwise.

- Stop turning the Eyepiece Corrector Ring at the point where the indications in the Finder are sharpest.

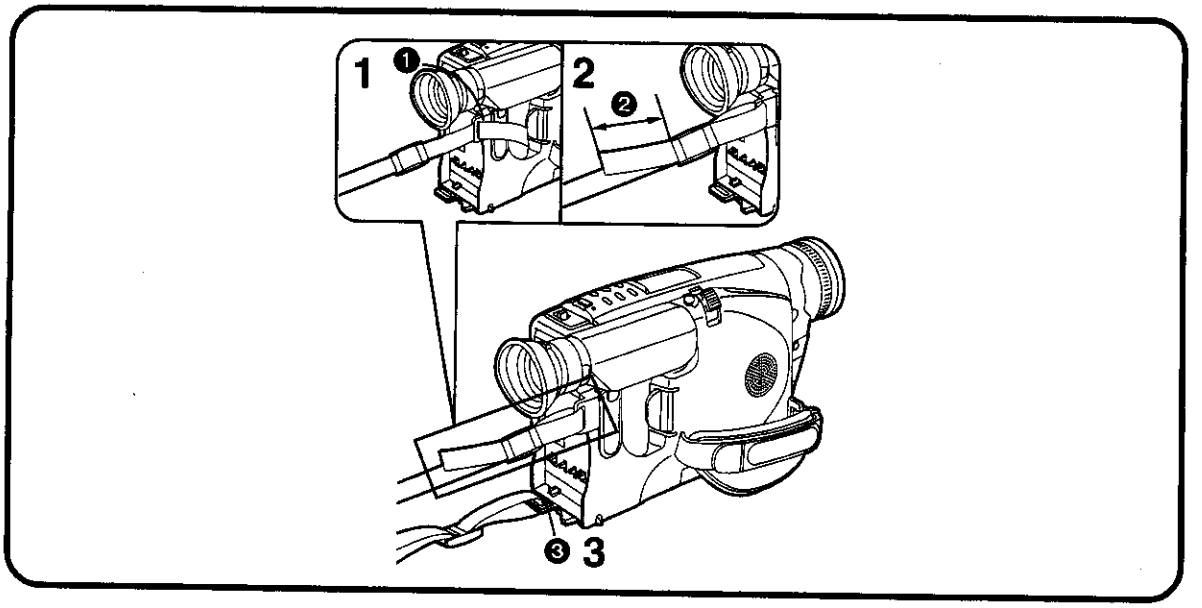
Never aim the Movie Camera with its Finder or Lens directly at the sun; this could damage internal parts of the unit.

Adjusting the Grip Belt

Adjust the length of the Grip Belt so that you can easily press the Recording Start/Stop Button ❸ with your thumb and push the [W•T] Zoom Lever ❹ with your index or middle finger.

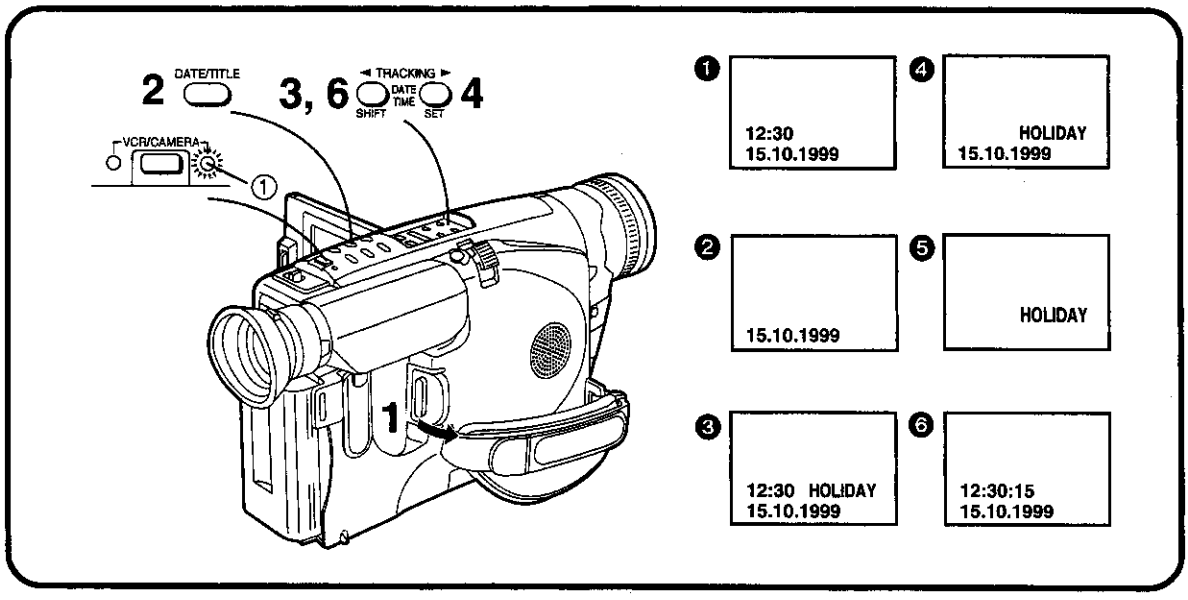
Handling the Lens Cap

Remove the Lens Cap from the Lens Hood and hook it onto the Grip Belt ❺.



Attaching the Shoulder Strap

1. Pull one end of the Shoulder Strap through the Shoulder Strap Holder ❶.
2. Fasten this end of the Shoulder Strap securely (❷ more than 2 cm).
3. Perform the above steps to attach the other end of the Shoulder Strap to the other Shoulder Strap Holder ❸ on the Movie Camera.



Setting the Date and Time

1 Turn out the [POWER] Switch to turn the Movie Camera on.

- The [CAMERA] Lamp ① lights.

2 Press the [DATE/TITLE] Button to make the Date/Time/Title Indication appear.

- To set the date and time, one of the indications other than the Title Indication alone ❺ shown above must be displayed. If the Title Indication alone ❺ is displayed, select another Date/Time/Title indication (❶ – ❹ or ❻). (➔ 28)

3 Press the [DATE/TIME/SHIFT] Button until the "Year" portion flashes.

4 Press the [DATE/TIME/SET] Button repeatedly until the current year (for example: 1999) is displayed.

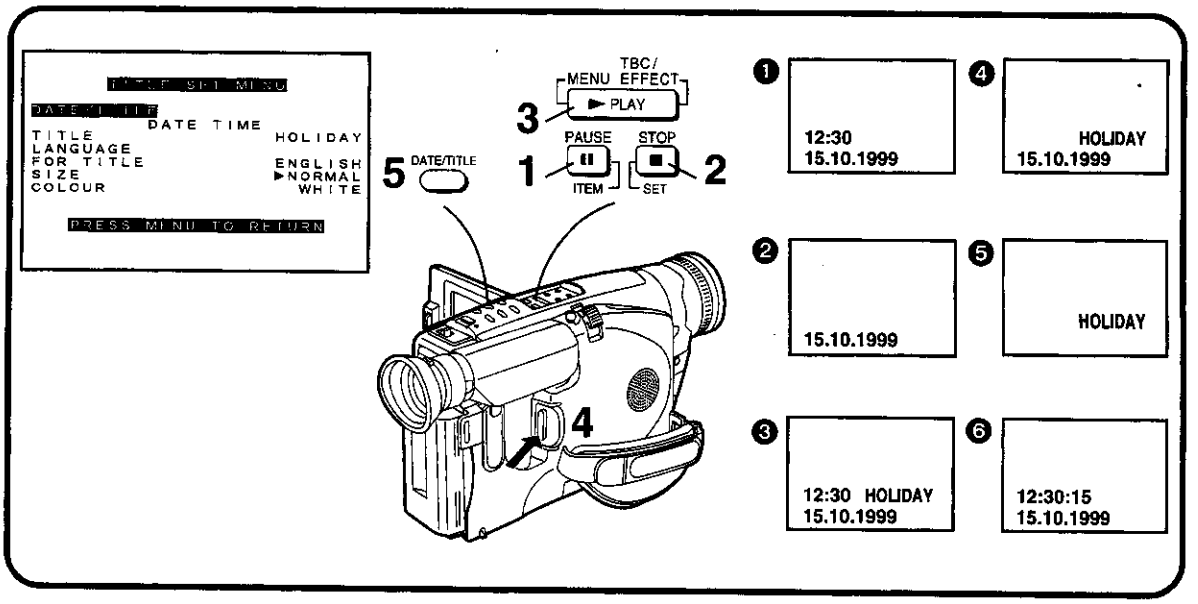
- Keeping the [DATE/TIME/SET] Button pressed changes the figures more quickly.
- The figures in the Date/Time Indication change in the following order:

Year: 1990→1991→ ..... →2089→1990→...
Month: 1→2→ ..... →12→1→...
Day: 1→2→ ..... →31→1→...
Hour: 0→1→ ..... →23→0→...
Minute: 00→01→ ..... →59→00→...

5 Also set the "Month", "Day", "Hour", "Minute" in the same way as explained in steps 3 and 4.

6 After you have set the date and time and confirmed that they are correct, press the [DATE/TIME/SHIFT] Button.

- The operation of the clock starts.
- If you make a mistake during setting, start again from step 3 above.



Recording with the Time and/or Date Superimposed in the Picture

After displaying the [TITLE SET MENU] Menu... (→ 17)

1 Press the [ITEM] Button repeatedly to select [DATE/TITLE].

2 Press the [SET] Button repeatedly until the desired indication appears on the Title Menu.

- The indications change in the order ❶ to ❻.
  ❶ Date and Time ⟶ ❷ Date ⟶
  ❸ Date, Time and Title ⟶ ❹ Date and Title ⟶
  ❺ Title ⟶ ❻ Date and Time with seconds ⟶
- After turning the Movie Camera off and then on again, the previously selected Date/Time/Title Indication is no longer displayed. To make it appear again, press the [DATE/TITLE] Button once.

3 Press the [MENU] Button twice to exit the menu.

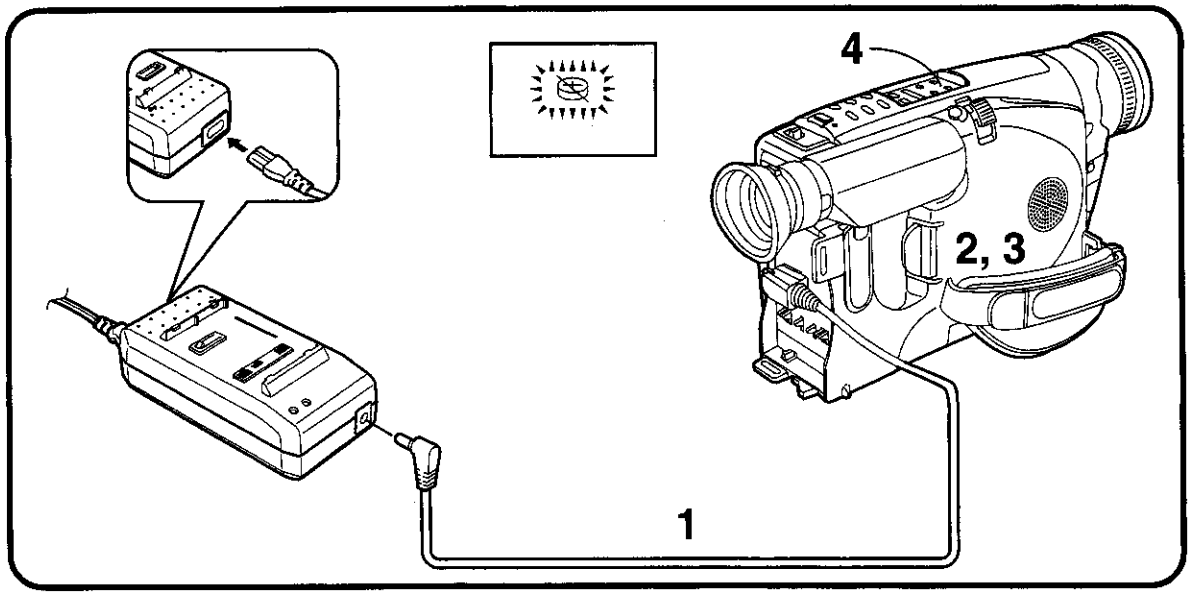
- The selected Date/Time/Title Indication appears.

4 Press the Recording Start/Stop Button to start recording.

■ Deleting the Date/Time/Title Indication

5 During recording or when the Movie Camera is in the Recording Pause Mode, press the [DATE/TITLE] Button to make the Date/Time/Title Indication disappear.

Be sure to turn the Movie Camera off before removing the Battery or disconnecting the AC Adaptor. Disconnecting the power supply while the Movie Camera is on erases the Date/Time/Title Indication **(→ 74)** stored in memory.



WARNING

THE LITHIUM BATTERY IN THIS UNIT MUST ONLY BE REPLACED BY QUALIFIED PERSONNEL. IF THIS IS NECESSARY, CONTACT THE PANASONIC CUSTOMER CARE CENTRE ON 132 600 FOR YOUR NEAREST AUTHORIZED SERVICE CENTRE.

Charging the Built-in Lithium Battery

The internal clock works even when the Movie Camera is turned off, and it consumes power from the built-in lithium battery. When the Movie Camera is in operation, it automatically charges this battery. However, if the Movie Camera is not used for a very long time, the lithium battery can become discharged. This has occurred if the [⧖] Indication flashes when you turn on the Movie Camera. In this case, perform the following operations.

■ Charging the Built-in Lithium Battery and Other Required Operations

1 **Connect the AC Adaptor to an AC mains socket and to the Movie Camera.**

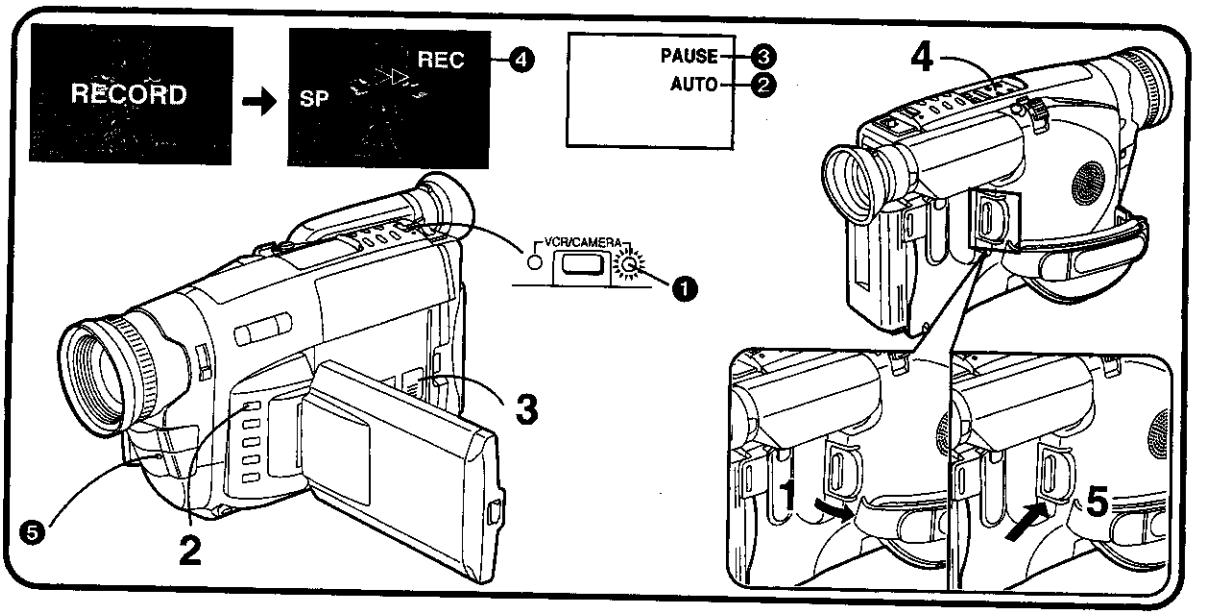
2 **Leave the Movie Camera turned off.**

- Although charging the lithium battery is possible with the Movie Camera turned on or off, we recommend to keep it turned off to conserve energy.

3 **Leave the Movie Camera in this condition for approximately 4 hours.**

- Charging the lithium battery in this way for 4 hours maintains the clock operation for approximately 6 months, charging for 26 hours (full charge) maintains it for approximately 2 years.

4 **Set the clock to the current date and time.** **(→ 27)**



Recording in the Full Auto Mode

The Full Auto Mode adjusts the white balance and focus automatically. However, if you want, you can also adjust either one or both of them manually (➔ 64, 66).

1 Turn out the [POWER] Switch to turn the Movie Camera on.

- The [CAMERA] Lamp ❶ lights.

2 Confirm that the [AUTO] Indication ❷ is displayed.

- The initial setting is [AUTO].
- If the [MNL], [ ], [ ], [ ], [ ] or [ ] Indication is displayed, press the [PROGRAMME AE] Button repeatedly until the [AUTO] Indication appears.

3 Insert a cassette with an intact erasure prevention tab.

- The [PAUSE] Indication ❸ appears.

4 Set [SPEED] on the [MAIN MENU1] Menu to the desired recording speed ([SP] or [LP]).

- The indication of the selected recording speed appears.

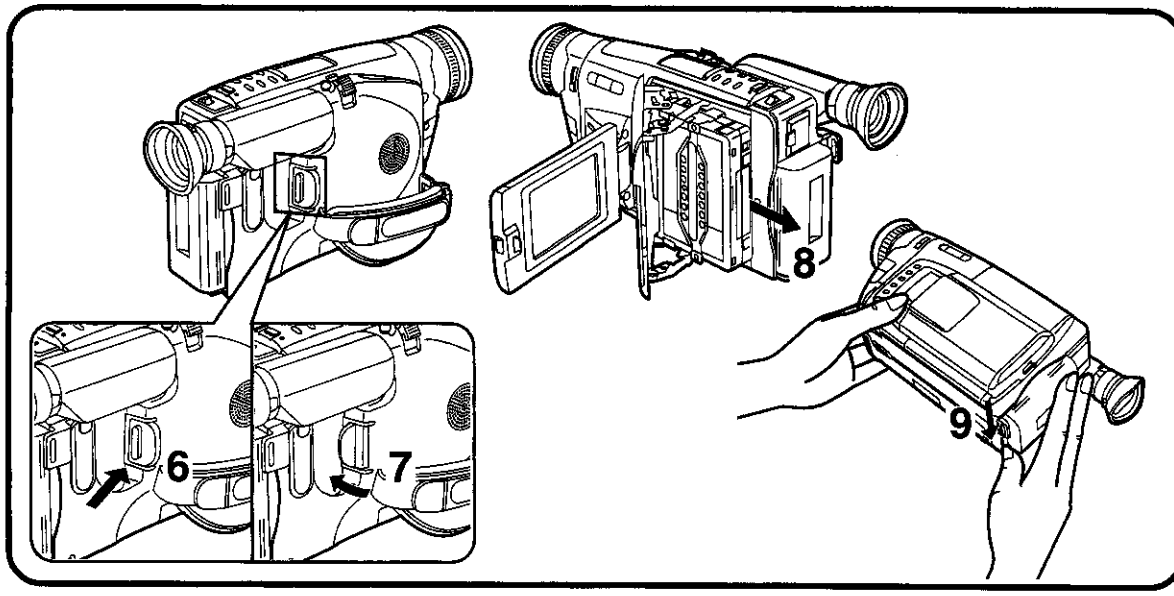
5 Press the Recording Start/Stop Button to start recording.

- Recording starts and the [▷▷] Indication and the [REC] Indication ❹ appear. The Tally Lamp ❺ on the front of the Movie Camera remains lit during recording.
  ([REC] means Recording.)

Tally Lamp

If you don't want the Tally Lamp to light during recording, set [TALLY LAMP] on the [MAIN MENU2] Menu to [OFF].

- During recording, it is not possible to change the recording mode ([MNL], [ ], [ ], [ ], [ ], [ ]), even if you press the [PROGRAMME AE] Button. (➔ 67)



■ **Stopping Recording**

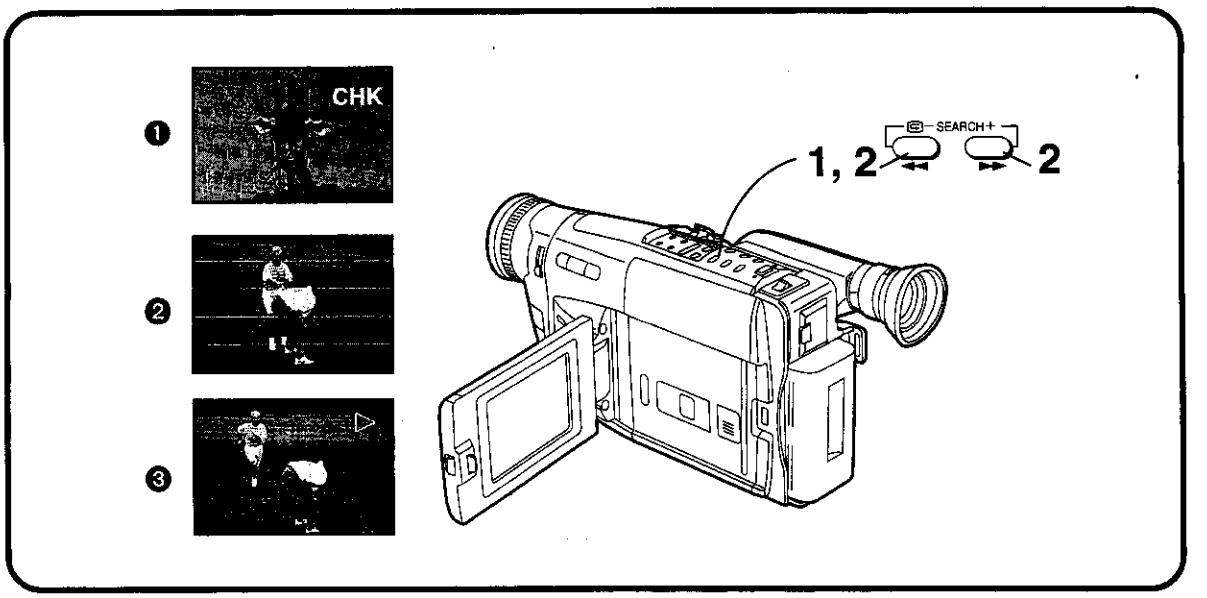
6 **Press the Recording Start/Stop Button.**
- Recording stops and the Movie Camera changes over to the Recording Pause (Standby) Mode.

7 **Turn in the [POWER] Switch to turn the Movie Camera off.**

8 **Take out the cassette. (➔ 22)**

9 **Disconnect the AC Adaptor or remove the Battery.**

If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. To resume recording from this condition, turn in the [POWER] Switch (the Movie Camera switches off) and then turn it out again.



Checking the End of a Recorded Scene (Recording Check Function)

By automatically playing back the final approximately 2 seconds of the last recorded scene, this function lets you check if a just finished scene has been recorded correctly. When you then start recording the next scene, it is automatically joined with a smooth transition free from picture distortion. For especially important scenes, use this function from time to time for confirmation.

1 Press the [⇆] Button briefly in the Recording Pause Mode.

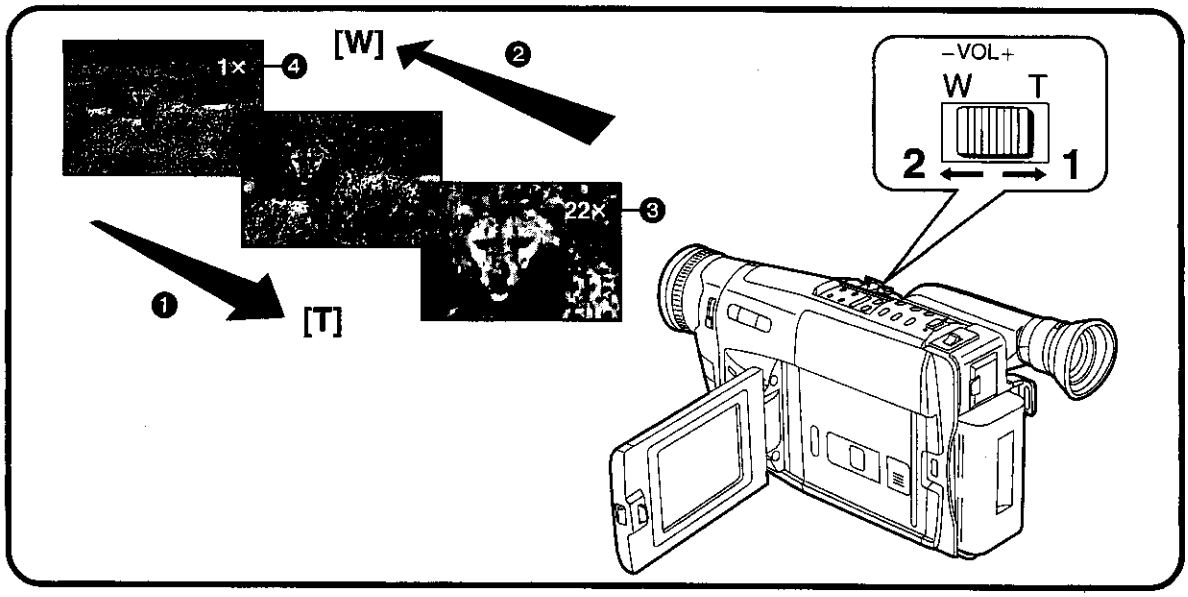
- The [CHK] Indication ❶ appears and the final approximately 2 seconds of the last recorded scene are played back.
  After that, the Movie Camera returns to the Recording Pause Mode and is ready for recording the next scene.
  ([CHK] means Check.)

Searching for a Tape Position Before the End of the Last Recording (Camera Search Function)

This function makes it easy to search for a point in a previously recorded scene or cassette from which you want to start recording a new scene. In addition, it ensures smooth scene-to-scene transitions free from picture distortion.

2 Keep the [−SEARCH] Button (or the [SEARCH+] Button) pressed in the Recording Pause Mode.

❷: Reverse Search
❸: Forward Search



Zooming In/Out

■ Zooming in ❶

Zooming in lets you record close-ups of distant subjects.

1 Push the [W•T] Zoom Lever toward [T].

- The Zoom Magnification Indication ❸ appears.

■ Zooming out ❷

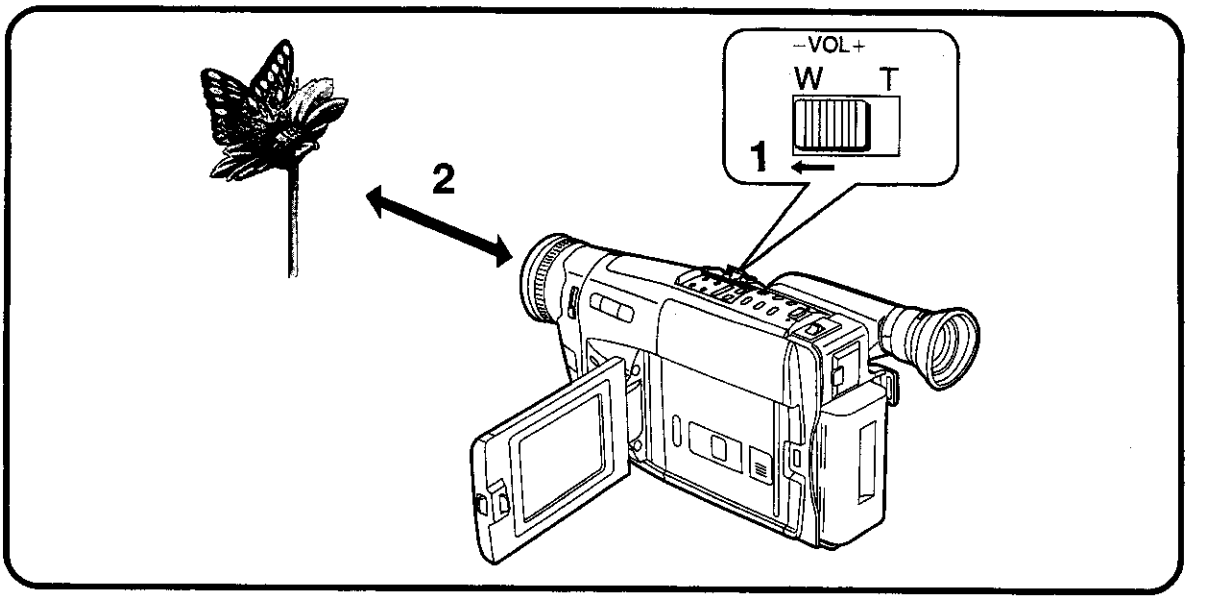
Zooming out lets you record wider views.

2 Push the [W•T] Zoom Lever toward [W].

- The Zoom Magnification Indication ❹ appears.

- Zooming is possible between wide-angle (Zoom Magnification Indication [1×]) and telephoto (Zoom Magnification Indication [22×]).
- The farther you push the [W•T] Zoom Lever toward [W] or [T], the faster the zooming speed becomes.
- In the maximum telephoto setting (when you have zoomed in), precise focusing is only possible for subjects that are more than 2.2 m from the lens.

Avoid too much zooming during recording as it gives videos an unprofessional look.



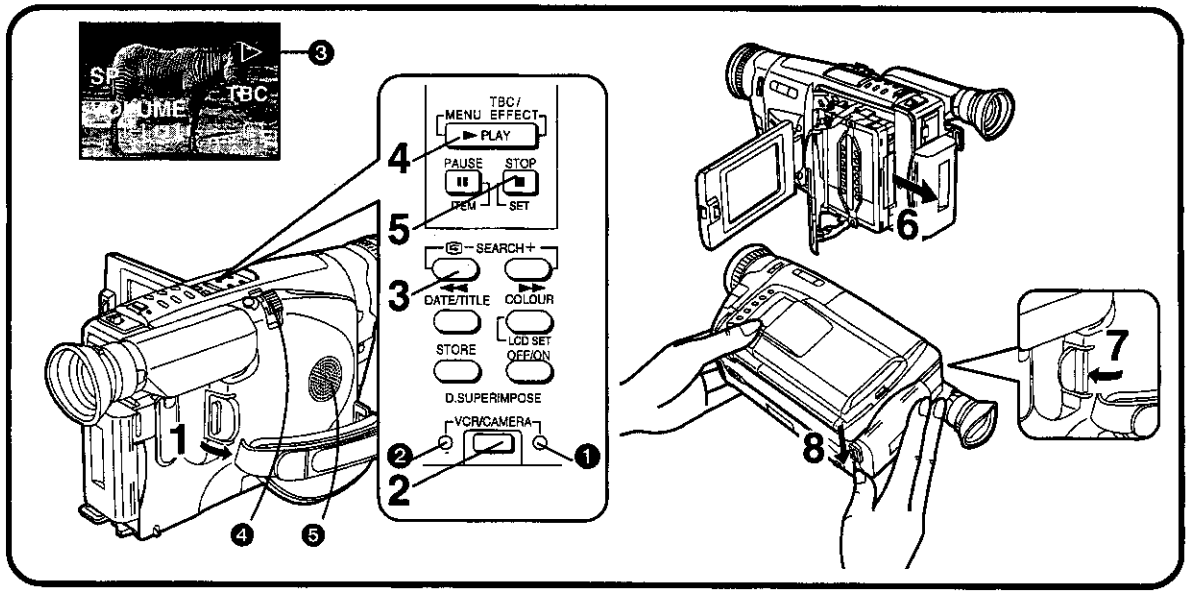
Using the Macro Close-up Function

This function lets you record very small subjects such as insects.

1 Keep the [W•T] Zoom Lever pushed toward [W] to zoom to the maximum wide-angle setting (Zoom Magnification Indication [1×]).

2 Approach the subject with the Movie Camera until it reaches the desired size in the picture.

- With the lens in the maximum wide-angle setting, the Movie Camera can automatically focus on subjects from infinity to a minimum distance of only 5 mm between lens and subject.
- To prevent unstable pictures, use a tripod (optional) for macro close-up recording.
- If you use the Macro close-up Function and approach extremely close to the subject when recording in the 0 Lux Night View Function, the infra-red beam from the Movie Camera's built-in Infra-red Beam Emitters may not reach the subject.



Playback

Watching Playback on the Movie Camera

You can watch playback of the recorded scenes.

1 Turn out the [POWER] Switch to turn the Movie Camera on.

- The [CAMERA] Lamp ❶ lights.

2 Press the [VCR/CAMERA] Button to select the VCR Mode.

- The [VCR] Lamp ❷ lights.

3 Press the [◀◀] Button.

- The tape starts to rewind. When the tape reaches the beginning, the rewinding automatically stops.

4 Press the [PLAY] Button.

- Playback starts and the [▷] Indication ❸ appears. When the tape reaches the end, it automatically rewinds to the beginning.

■ Stopping Playback

5 Press the [STOP] Button.

- Playback stops and the Movie Camera changes over to the Stop Mode.

6 Take out the cassette. (➔ 22)

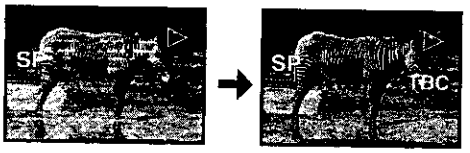
7 Turn in the [POWER] Switch to turn the Movie Camera off.

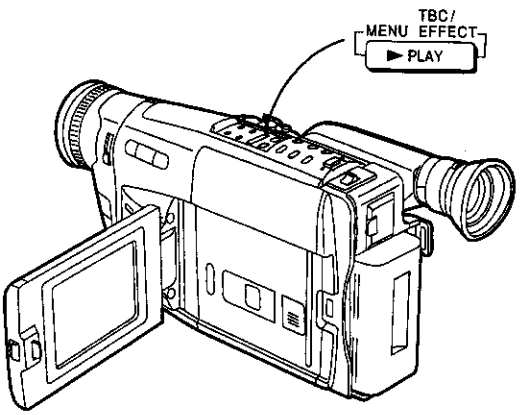
8 Disconnect the AC Adaptor or remove the Battery.

■ Adjusting the Sound Volume

Push the [−VOL+] Lever ❹ toward [+] to increase the volume or push it toward [−] to decrease the volume. The [VOLUME] Indication appears and the number of bars increases or decreases. When you release the Lever, this indication disappears.
You can also adjust the volume with the Remote Controller. Increase the volume by pressing the [T] Button, or decrease it by pressing the [W] Button. This adjustment is only possible during playback.

- Do not cover the Speaker ❺ during playback.
- Because the speaker contains a magnet, do not bring a cassette near the speaker. It could adversely influence the recorded content.





TBC (Time Base Corrector) Function

Playback of certain cassettes can cause slight horizontal shaking of the picture or other distortion. To minimise such distortion and ensure a stable playback picture, this Movie Camera is equipped with the TBC Function. This function is automatically activated within a few seconds after playback of a cassette recorded in the SP Mode has started, and the [TBC] Indication appears.

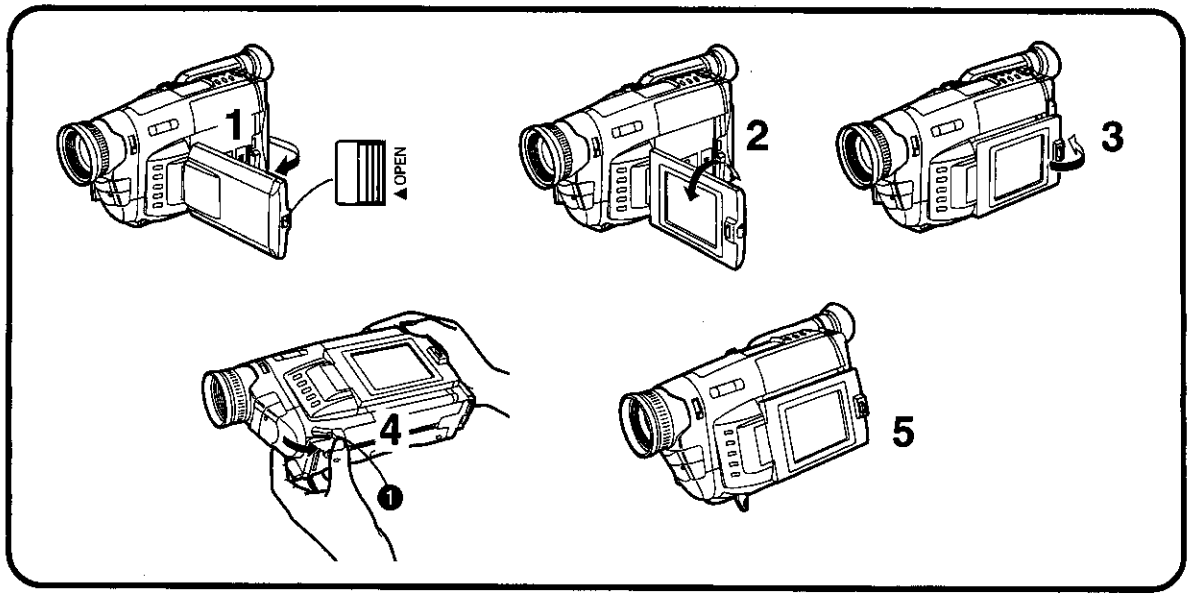
Cancelling the TBC Function

With certain cassettes, however, the TBC Function could cause slight vertical shaking or other distortion in the playback picture.
In this case, first try to adjust the tracking (➔ 40). If this does not improve the picture, cancel the TBC Function by keeping the [TBC] Button pressed until the [TBC] Indication disappears.
If you want to turn the TBC Function on again, press the [TBC] Button for a few seconds until the [TBC] Indication reappears.
Even if you cancel the TBC Function, it is automatically turned back on when you switch the Movie Camera from the Camera Mode to the VCR Mode.

■ In the Following Cases, the TBC Function Does Not Work:

- In the Cue, Review or Still Playback Mode
- When using the Camera Search or Recording Check Function
- When adjusting the tracking
- When playing back a cassette recorded in the LP Mode
- When playing back an unrecorded part on the tape

When you play back a cassette with stretched, shrunk or otherwise damaged tape, the TBC Function does not work correctly (it may repeatedly turn on and off). In this case, cancel the TBC Function.



Watching Playback on the LCD Monitor with the Movie Camera Placed on a Table

1 **Slide the [▲OPEN] Lever to the left and simultaneously open the LCD Monitor in the direction of the arrow approximately 90°.**

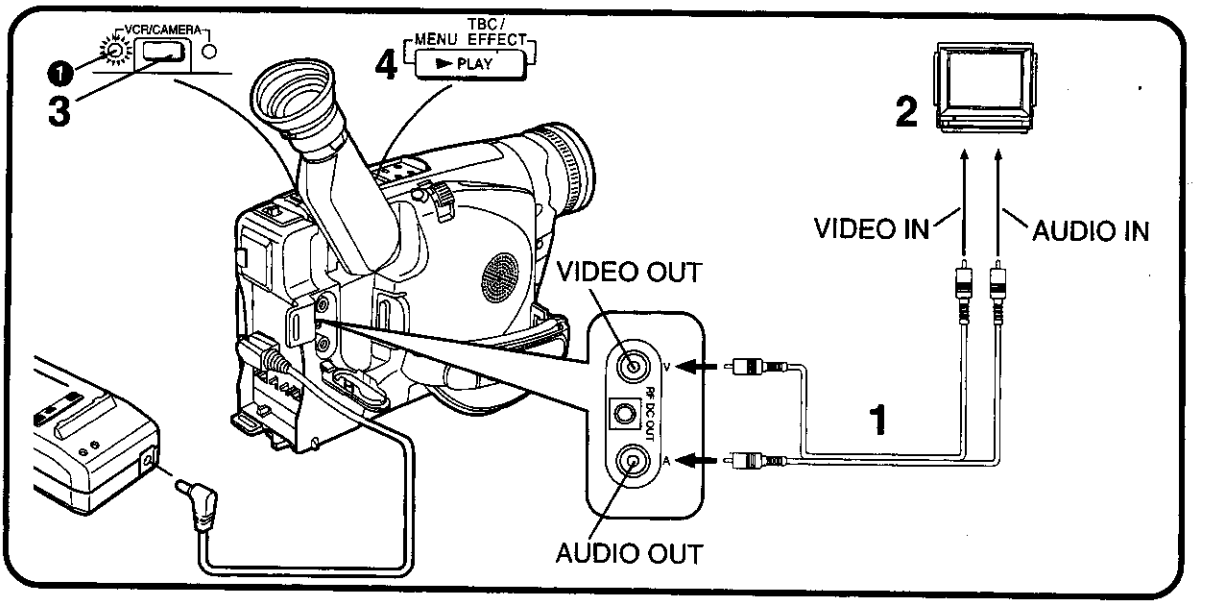
2 **Turn the LCD Monitor so that it faces forward approximately 180°.**

3 **Close the LCD Monitor.**

4 **Extend the LCD Monitor Support Leg ❶.**

5 **Place the Movie Camera on a flat, stable surface for playback.**

- If you use the Remote Controller to operate the Movie Camera, use it within approximately 1 metre from the Movie Camera.
- When recording in the Mirror Mode (➔ 73), the Date, Time and/or Title Indications cannot be inserted in the picture. Therefore, they are also not included in the playback picture.



Watching the Picture on a TV

By connecting the Movie Camera to a TV, you can watch playback of the recorded scenes on the TV screen.

Before connecting, turn off both the Movie Camera and the TV for safety's sake.

1 Use the AV Cable (supplied) to connect the Movie Camera with the TV.

Movie Camera		TV (AV Input Sockets)
VIDEO OUT	⟶	VIDEO IN
AUDIO OUT	⟶	AUDIO IN

2 Select the programme position (channel) or the AV input channel on the TV which corresponds to the video/audio input sockets used for connecting.

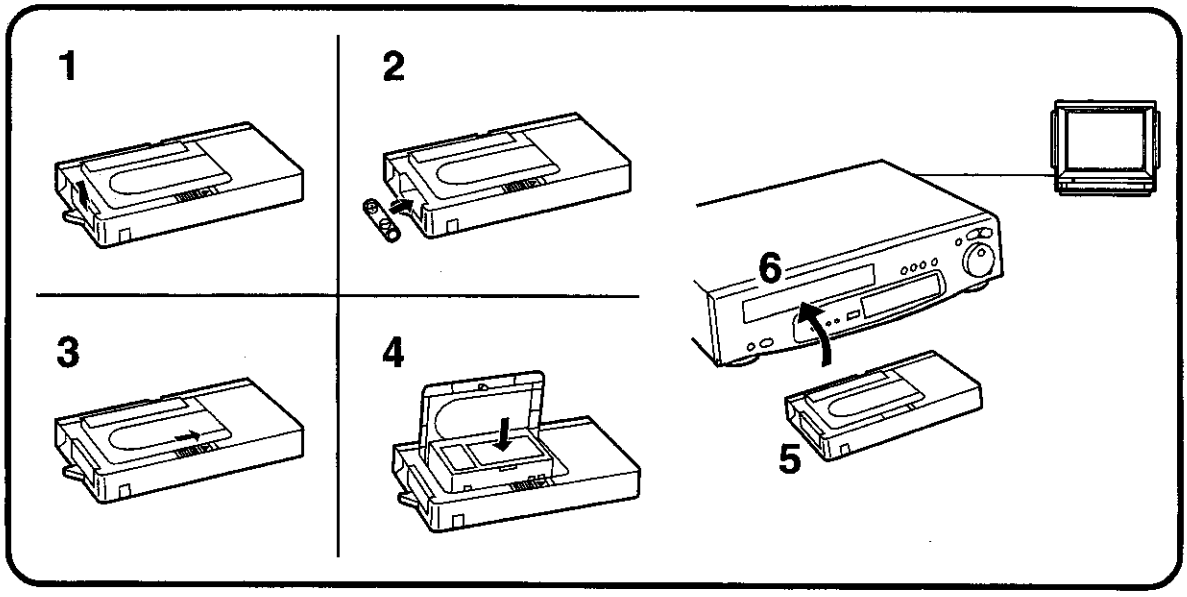
(Refer to the operating instructions of your TV).

3 Press the [VCR/CAMERA] Button to select the VCR Mode.

- The [VCR] Lamp ❶ lights.

4 Start playback on the Movie Camera. (➔ 35)

If your TV is not equipped with AV Input Sockets, the RF Adaptor (VW-RF7E; optional) is necessary.
Consult your dealer.

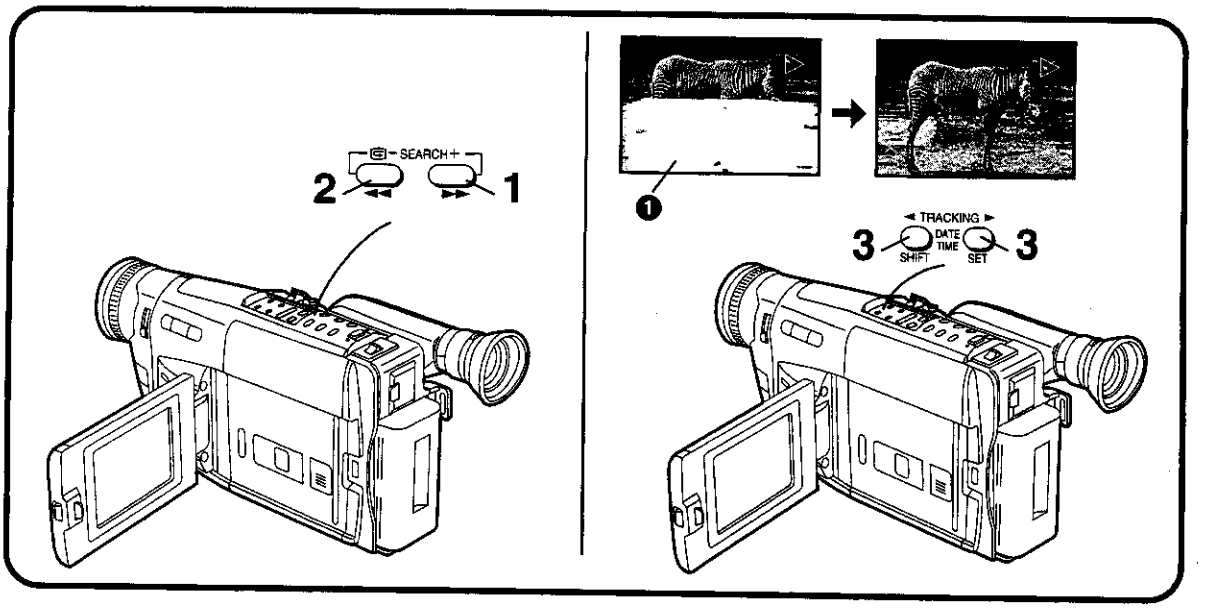


Playing Back on a VCR (Using the Supplied Cassette Adaptor)

By using the supplied Cassette Adaptor, you can play back compact cassettes in your VCR in the same way as full-size cassettes.

1. **Push the Battery Compartment Cover upward and remove it.**
2. **Insert the supplied battery and then re-attach the Battery Compartment Cover.**
3. **Slide the Open Lever in the direction of the arrow.**
4. **Insert the recorded cassette and close the Top Cover.**
5. **Insert the Cassette Adaptor into the VCR.**
6. **Start playback on the VCR.**

After use, take out the cassette from the Cassette Adaptor.



Fast-Forwarding

1 Press the [▶▶] Button in the Stop Mode.

- When the tape reaches the end, it automatically rewinds to the beginning.

Rewinding

2 Press the [◀◀] Button in the Stop Mode.

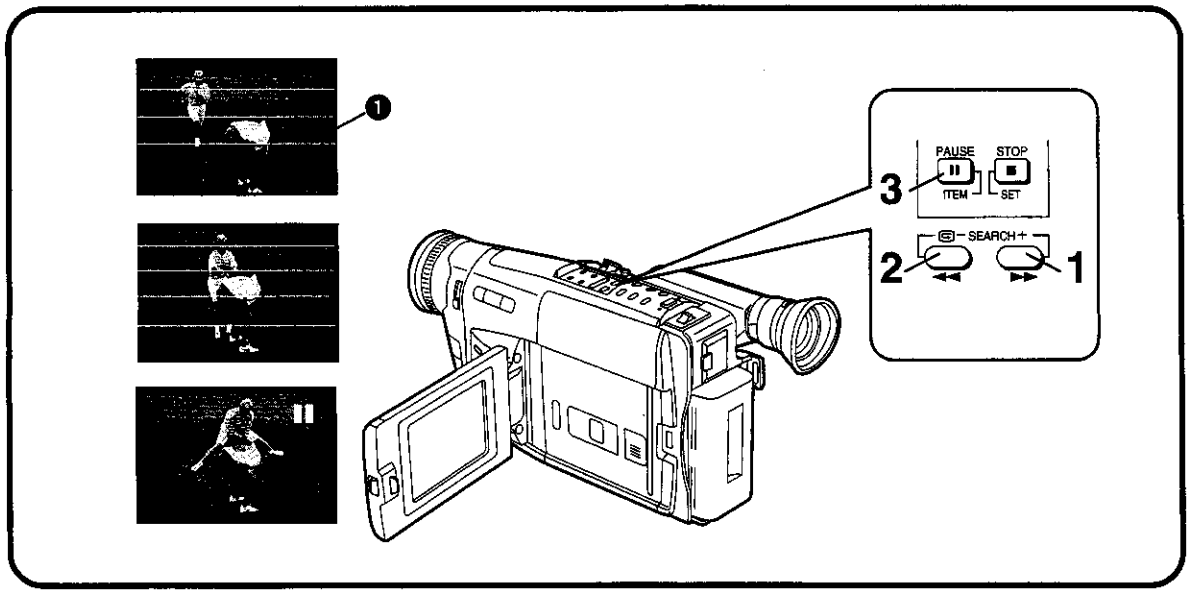
- When the tape reaches the beginning, the rewinding automatically stops.

Eliminating Picture Distortions (Tracking Adjustment)

If horizontal noise bars ❶ appear in the playback picture, you can reduce this picture distortion by adjusting as follows:

3 Press the [◀ TRACKING] and [TRACKING ▶] Buttons simultaneously during playback.

If pressing both buttons simultaneously does not improve the picture quality, adjust the tracking by pressing the [◀ TRACKING] or [TRACKING ▶] Button individually. (It may not be possible to remove the noise bars completely.)



Cue Playback

1 Keep the [▶▶] Button pressed during normal playback.

Resuming Normal Playback
Release the [▶▶] Button.

Review Playback

2 Keep the [◀◀] Button pressed during normal playback.

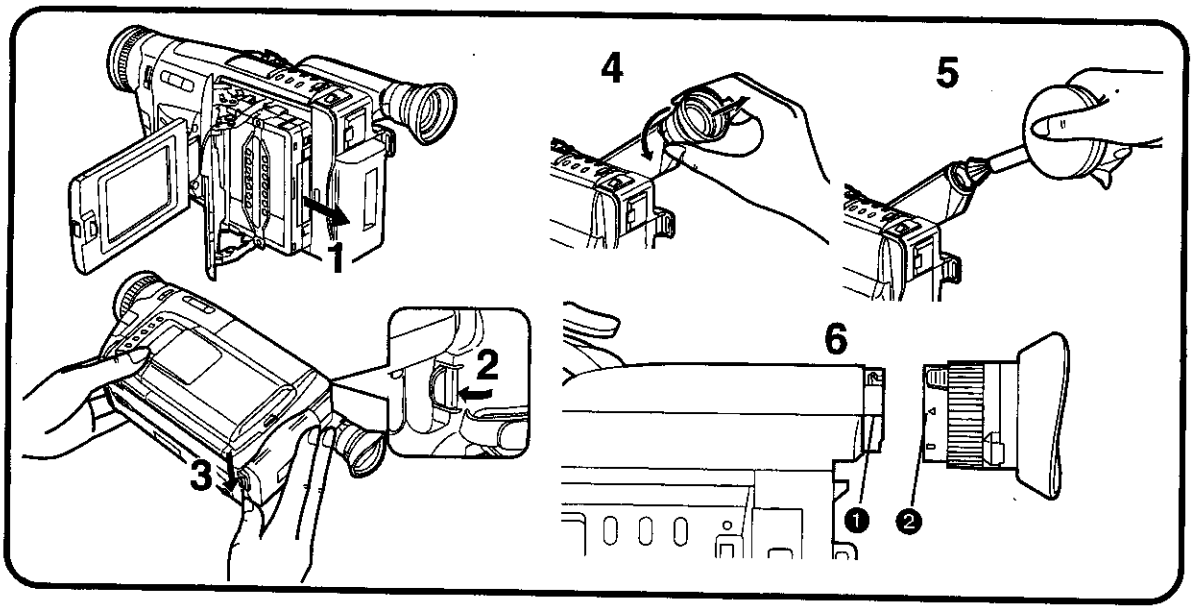
Resuming Normal Playback
Release the [◀◀] Button.

Still Playback

3 Press the [PAUSE] Button during normal playback.

Resuming Normal Playback
Press the [PAUSE] Button again.

- In the Cue, Review and Still Playback Modes, horizontal noise bars ❶ appear in the picture, or the picture may become black and white or distorted.
- The picture reproduced on the LCD Monitor contains less noise than the picture in the Finder. During playback on a TV, however, the picture noise is the same as in the Finder.
- During Cue or Review Playback, no indications are displayed on the LCD Monitor.
- If you leave the Movie Camera in the Still Playback Mode for about 6 minutes, it automatically switches over to the Stop Mode. And, if the Movie Camera is being powered by the Battery, it switches off completely after a further 6 minutes.



After Use

1 **Take out the cassette. (→ 22)**

2 **Turn in the [POWER] Switch to turn the Movie Camera off.**

3 **Disconnect the AC Adaptor or remove the Battery.**

Cleaning the Finder

If dust has entered the Finder...

4 **Turn the Finder counterclockwise and pull it off.**

5 **Remove dust with a blower brush (not supplied).**

- If you use a cotton swab or similar to clean the inside of the Finder, use it very carefully to prevent scratching the screen inside the Finder.

6 **To re-attach the Finder, insert it so that the marks ❶ and ❷ are aligned, and then turn the Finder clockwise until it stops.**

Cleaning the LCD Monitor

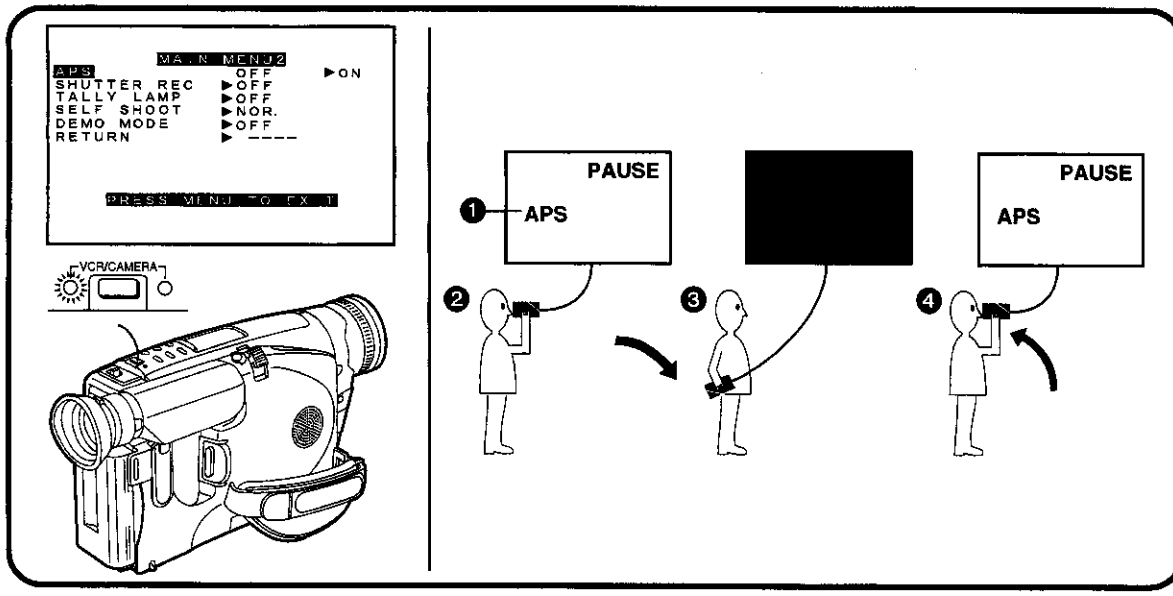
Clean the LCD Monitor with the supplied Cleaning Tissue or a blower brush.

Cleaning the Movie Camera Body

Wipe it with a clean, soft cloth.

Cleaning the Lens

Clean the lens with the supplied Cleaning Tissue or a blower brush.



Using the Power Save Functions

To ensure economical use of electric power from your Battery, this Movie Camera is equipped with two Power Save Functions:

1. **Auto Power Save Function (explained below)**
2. **Anti-Ground Recording Function (➔ 44)**

Before using these functions, make sure that the LCD Monitor is completely closed. (While the LCD Monitor is open, these functions do not become activated.)
If you want to use these functions, set [APS] on the [MAIN MENU2] Menu to [ON] so that the [APS] Indication ❶ appears.
([APS] means Auto Power Save.)

Using the Auto Power Save Function

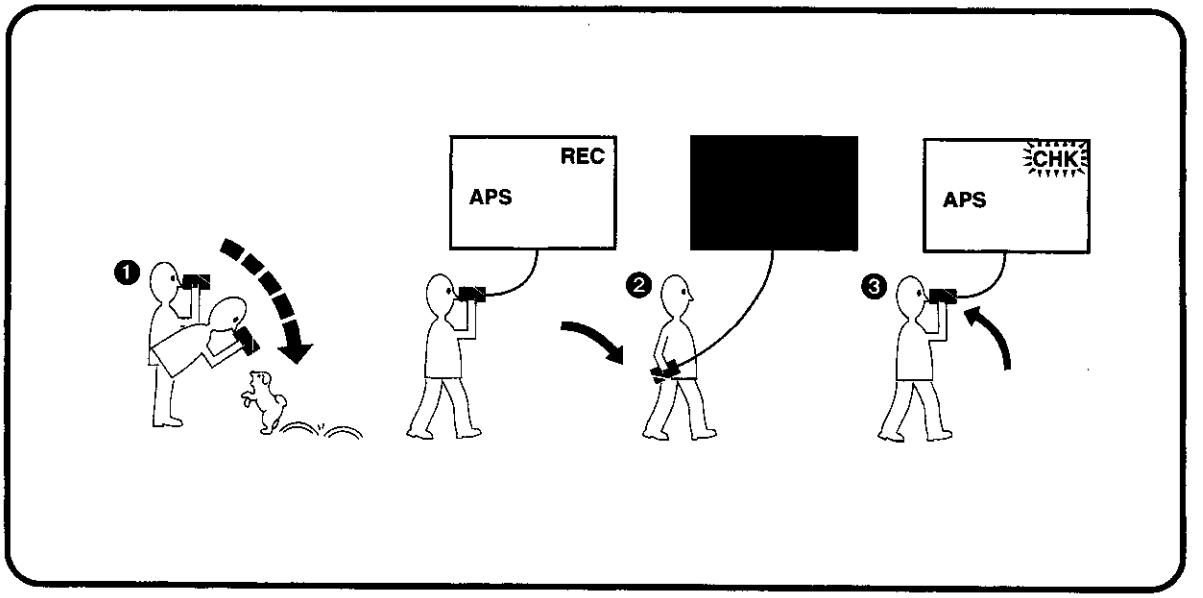
This function becomes activated only when the Movie Camera is in the Recording Pause Mode and you tilt the Movie Camera from the normal horizontal recording position ❷ downward by more than about 70° ❸ for more than a few seconds.
When this function becomes activated, the Finder turns off and the [VCR] Lamp flashes.

Resuming Recording

When you return the Movie Camera to a roughly horizontal position ❹, the Movie Camera is again in the Recording Pause Mode. Press the Recording Start/Stop Button to restart recording.

Cancelling the Auto Power Save Function

Set [APS] on the [MAIN MENU2] Menu to [OFF] so that the [APS] Indication ❶ disappears.
This also cancels the Anti-Ground Recording Function. **(➔ 44)**



Using the Anti-Ground Recording Function

This function prevents unintentional recording of the ground, your feet, etc. It becomes activated only when the Movie Camera is in the Recording Mode and you do one of the following:

- You tilt the Movie Camera quickly downward. (When you tilt the Movie Camera slowly downward for vertical panning during recording ❶, it does not become activated.)
- You tilt the Movie Camera slowly downward (by more than 70° ❷ from the normal horizontal recording position for more than a few seconds) and walk swinging the Movie Camera back and forth.

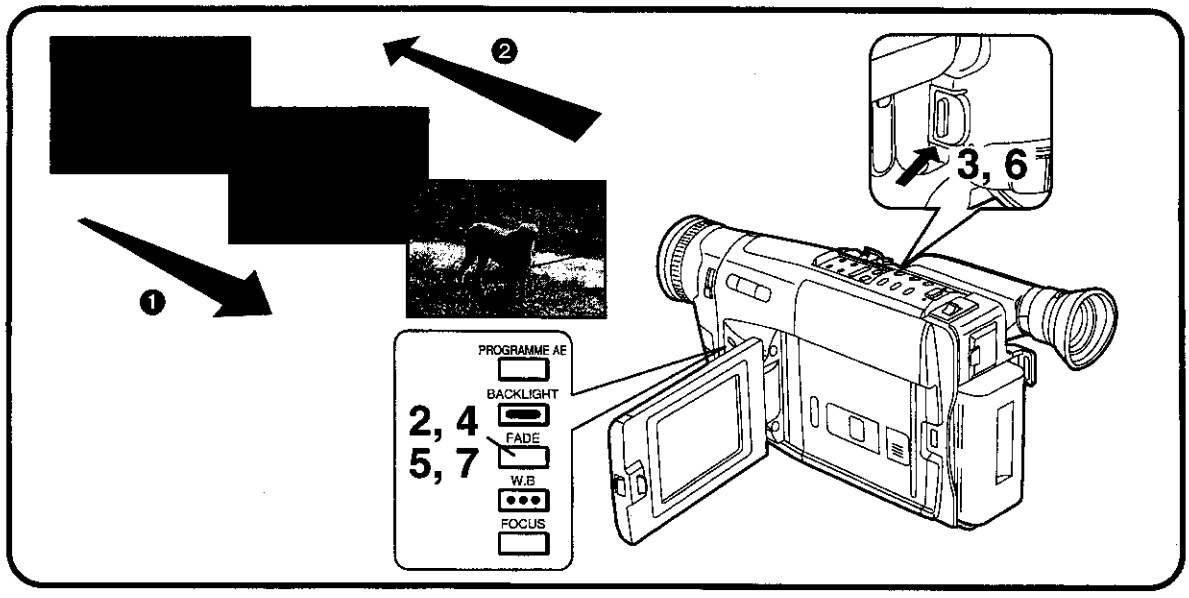
When this function becomes activated, the Movie Camera automatically switches over to the Recording Pause Mode, the Finder turns off and the [VCR] Lamp flashes.

Resuming Recording

- When you return the Movie Camera to a roughly horizontal position ❸, the Movie Camera is again in the Recording Pause Mode. Press the Recording Start/Stop Button to restart recording.
- As recording may have continued for a few seconds, the [CHK] Indication flashes. To erase this short unwanted part of the recording and smoothly join the next scene to the end of the last intentionally recorded scene, rewind the tape a little using the Camera Search Function (➔ 32) to locate the end of the last intentionally recorded scene. Then start recording the next scene.

Cancelling the Anti-Ground Recording Function

Set [APS] on the [MAIN MENU2] Menu to [OFF] so that the [APS] Indication disappears.
This also cancels the Auto Power Save Function.
(➔ 43)



Fading In/Out

■ Fading In ❶

Fading in lets you make the picture (and sound) appear gradually at the beginning of a recording.

1 **With the Movie Camera in the Recording Pause Mode, aim it at the scene that you want to record.**

2 **Press the [FADE] Button and keep it pressed.**

3 **When the picture has completely disappeared, press the Recording Start/ Stop Button to start recording.**

4 **Wait 3–4 seconds and then release the [FADE] Button.**

■ Fading Out ❷

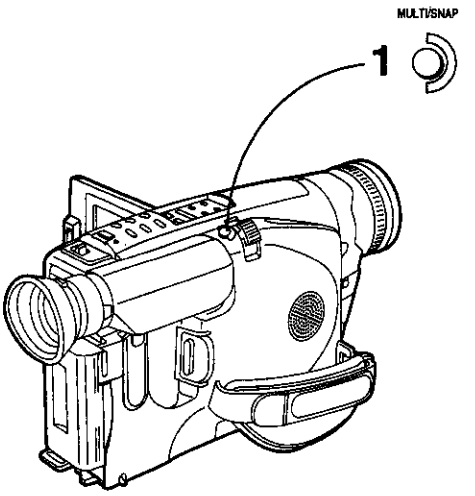
Fading out lets you make the picture (and sound) disappear gradually at the end of a recording. By fading out a scene and fading in the following one, you can produce smooth scene-to-scene transitions.

5 **During recording, press the [FADE] Button at the point where you want to fade out, and keep it pressed.**

6 **After the picture has completely disappeared, press the Recording Start/ Stop Button to stop recording.**

7 **Release the [FADE] Button.**

Fading in/out is not possible in the Multi Image Mode or the Picture-in-Picture Mode. **(➔ 53, 55)**



Recording a Still Picture

(Snapshot Recording)

You can record a still picture together with sound for approximately 5 seconds at the press of a button. This is convenient for example for recording sharp, stable still pictures of signboards, maps, etc. in your videos.

- Since the still picture is recorded from the digital image memory, the picture quality is slightly inferior to that of normally recorded pictures.
- To prevent picture distortion, do not move or shake the Movie Camera during still picture recording.

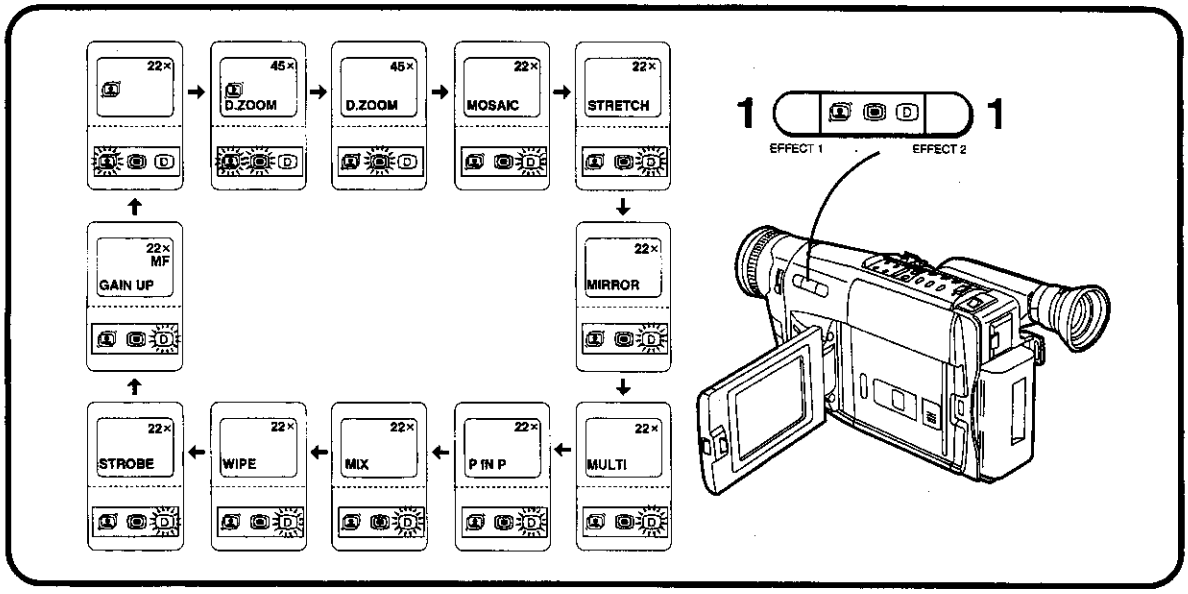
1 Press the [SNAP] Button in the Recording Pause Mode.

- The image stands still and the [SNAP] Indication appears.
- The still picture is recorded for approximately 5 seconds.

Shutter Effect Mode

If you set [SHUTTER REC] on the [MAIN MENU2] Menu to [ON], the screen blinks briefly like an SLR photo camera when you press the [SNAP] Button. This visual shutter effect is also recorded.

- When using the Snapshot Function repeatedly, wait at least 3–4 seconds before pressing the [SNAP] Button again.
- It is not possible to use the Snapshot Mode together with the Mix, Wipe, Multi Image, or Picture-in-Picture Mode. **(➔ 53, 55, 56, 57)**



Using Special Effects (Digital Effects)

In addition to the Super Image Stabilizer and Digital Zoom, this Movie Camera offers you a total of 16 different digital effect modes to make it easy to enhance your scenes in many creative ways. These effects are divided into two groups: Digital Effects 1 and Digital Effects 2. It is possible to select one effect from the Digital Effects 1 and another from the Digital Effects 2.

Selecting a Desired Digital Effect

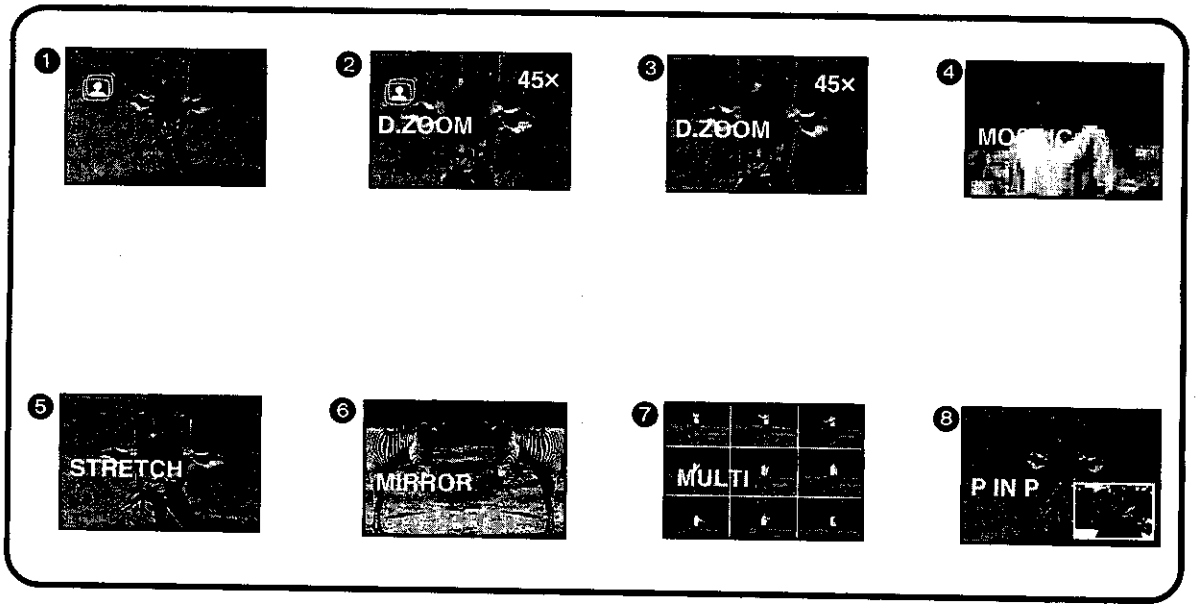
1 Press the [EFFECT1] or [EFFECT2] Button repeatedly until the indication of the desired Digital Effect appears.

- If you turn in the [POWER] Switch to turn the Movie Camera off and then turn it on again, the indication of the selected digital effect flashes for a few seconds to inform you of the selected setting.

Digital Effect 1 Button [EFFECT1]
Repeatedly pressing this button changes the digital effects in the order shown above. **(➔ 48, 49)**
Digital Effect 2 Button [EFFECT2]
Repeatedly pressing this button changes the digital effects in the order ❶ to ❼. **(➔ 50)**

Cancelling the Selected Digital Effects
Press the [EFFECT1] or [EFFECT2] Button repeatedly until no Digital Effect Indication is displayed any more. Or, keep the [EFFECT1] or [EFFECT2] Button pressed for more than 2 seconds to make the Digital Effect Indication disappear.

- In the Multi Image Mode, Picture-in-Picture Mode, Mix Mode, and Wipe Mode, it is not possible to use any of the Digital Fade Modes.
- In the Multi Image Mode and Picture-in-Picture Mode, normal fading in/out is not possible.



Digital Effects 1 [EFFECT1]

❶ Super Image Stabilizer Mode [ ] (→ 51)

This prevents shaky pictures when recording in the tele range or from a moving vehicle.

❷ Super Image Stabilizer and Digital Zoom Mode [/D.ZOOM]

This combination mode allows recording in the extreme tele range and prevents shaky pictures.

❸ Digital Zoom Mode [D.ZOOM] (→ 52)

It enlarges the subject beyond the optical zooming range.

❹ Mosaic Mode [MOSAIC]

The picture becomes mosaic-like.

❺ Stretch Mode [STRETCH]

The picture is stretched horizontally while its height remains unchanged.

❻ Mirror Mode [MIRROR]

The right half of the picture is a mirror image of the left half.

❼ Multi Image Mode [MULTI] (→ 53, 54)

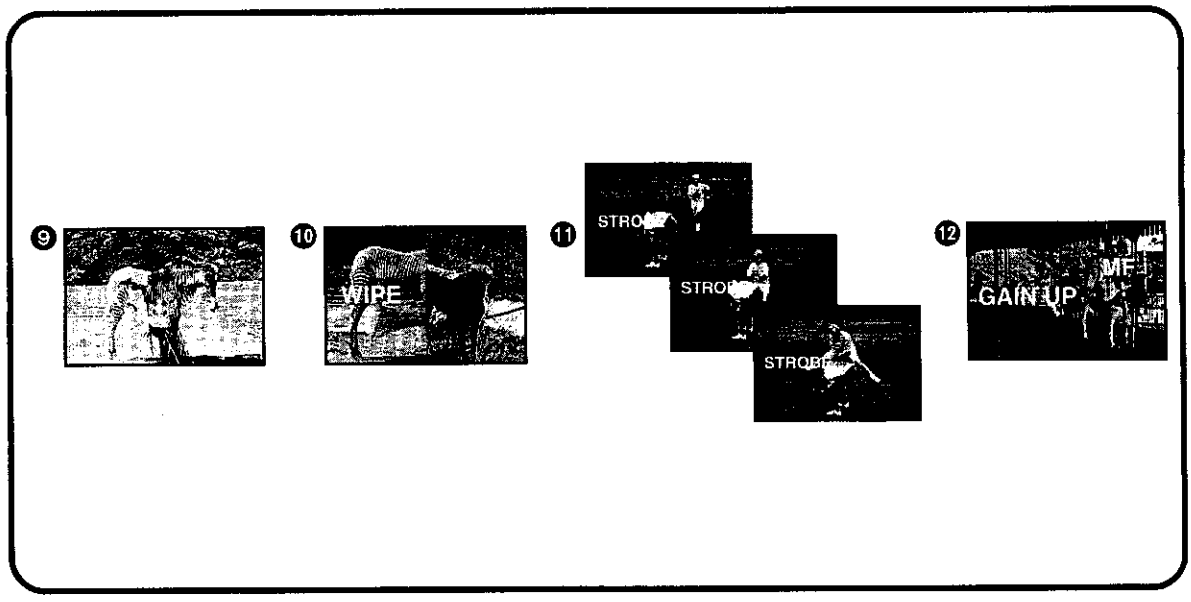
The screen is divided into 9 small still fields.

- The 9 small pictures are recorded with slightly inferior picture quality compared to that of normal moving pictures.
- It is not possible to use the Multi Image Mode together with the Snapshot Mode.
- In the Multi Image Mode, normal fading in/out and using any of the Digital Fade Modes are not possible.

❽ Picture-in-Picture Mode [P IN P] (→ 55)

A small still picture is inserted and displayed inside the normal picture.

- The small picture is recorded with slightly inferior picture quality compared to that of normal moving pictures.
- It is not possible to use the Picture-in-Picture Mode together with the Snapshot Mode.
- In the Picture-in-Picture Mode, normal fading in/out and using any of the Digital Fade Modes are not possible.



Digital Effects 1 [EFFECT1] (Continued)

⑨ Mix Mode [MIX] (➔ 56)

It gradually fades out one scene while fading in the new scene over it.

⑩ Wipe Mode [WIPE] (➔ 57)

With this function, you can change over from one scene to the next like drawing a curtain.

⑪ Strobe Mode [STROBE]

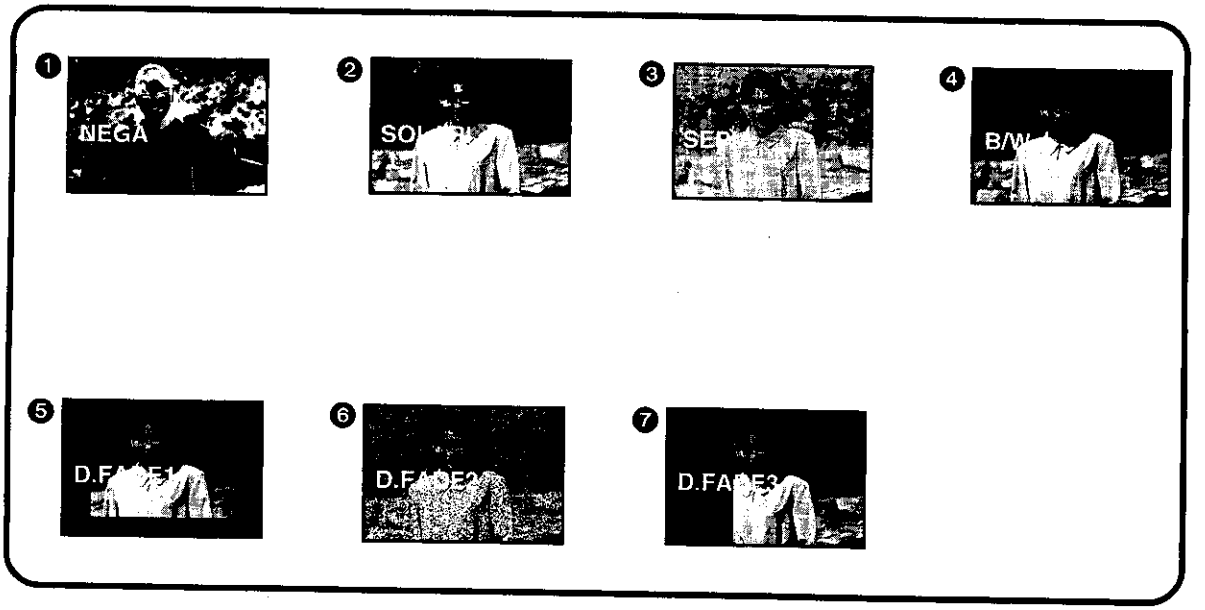
The picture has a stroboscope-like effect.

- Since the strobe pictures are recorded from the digital image memory, the picture quality is slightly inferior to that of normally recorded pictures.
- When recording under fluorescent lamps, the brightness of the picture may fluctuate.

⑫ Gain-up Mode [GAIN UP]

It electronically brightens up the picture. In this mode adjust the focus manually.

- It is not possible to use the Gain-up Mode together with the Sports Mode or the Portrait Mode.
- Some after-image distortion may occur during recording with the Gain-up Function.
- When the Gain-up Mode is used, it is not possible to manually adjust the white balance or to cancel the manually adjusted white balance setting.
- When the Gain-up Mode is used, the focus can only be adjusted manually even if the [AUTO] Indication is displayed.



Digital Effects 2 [EFFECT2]

❶ Negative/Positive Mode [NEGA]

The picture has reversed colours similar to photographic negatives.

❷ Solarisation Mode [SOLARI]

The picture has an effect similar to a painting.

❸ Sepia Mode [SEPIA]

Scenes have a brown tint similar to the colour of old photographs.

- When the Sepia Mode is used, it is not possible to manually adjust the white balance or to cancel the manually adjusted white balance setting.

❹ Black & White Mode [B/W]

The picture is in black and white.

- When the Black & White Mode is used, it is not possible to manually adjust the white balance or to cancel the manually adjusted white balance setting.

❺ Digital Fade 1 Mode [D.FADE1] (➔ 58)

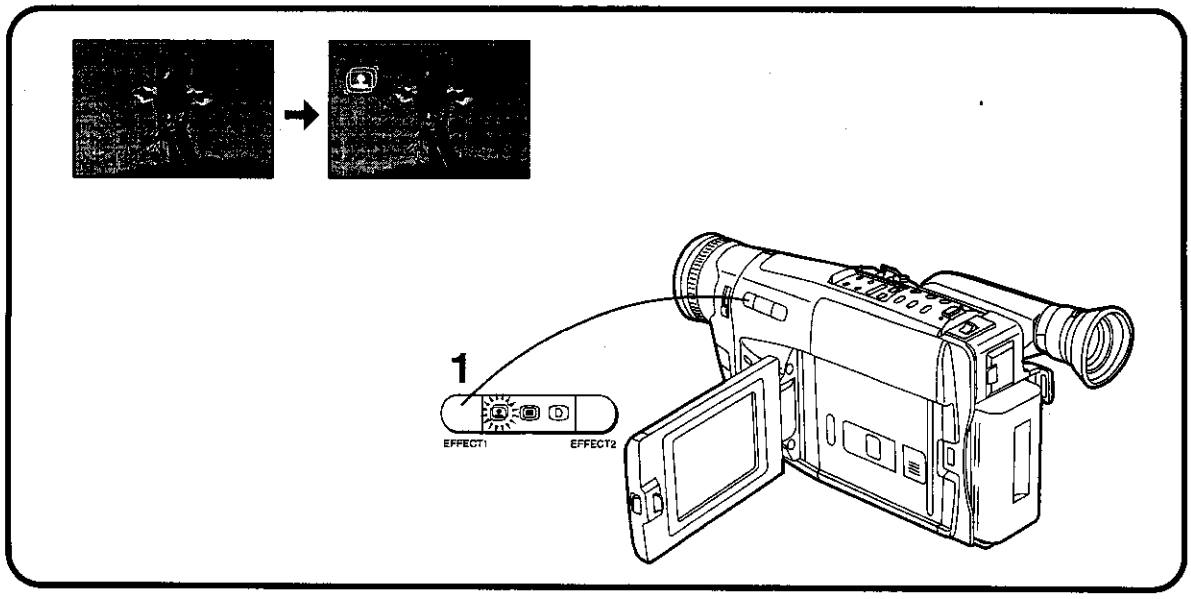
The picture fades in starting at the centre and extending toward the edges, and it fades out in reverse direction.

❻ Digital Fade 2 Mode [D.FADE2] (➔ 58)

The picture fades in from a white screen and fades out to white in small dots similar to snow melting or falling.

❼ Digital Fade 3 Mode [D.FADE3] (➔ 58)

The picture fades in with a wipe effect from a black screen and fades out to black.



Using the Super Image Stabilizer Function

This function compensates for camera-shake during hand-held recording and ensures stable pictures. It is especially practical for the following recording situations:

- Zooming in on a distant subject.
- Recording while walking.
- Recording from inside a moving car.

1 Press the [EFFECT1] Button repeatedly until the [ ] Indication appears.

- The Super Image Stabilizer Indication Lamp [ ] lights.
- When you use this function, the shutter speed is automatically adjusted between 1/125 s and 1/50 s according to the brightness of the scene.

Cancelling the Super Image Stabilizer Function

Press the [EFFECT1] Button repeatedly until the [ ] Indication disappears. Or, keep the [EFFECT1] Button pressed for more than 2 seconds to make the [ ] Indication disappear.

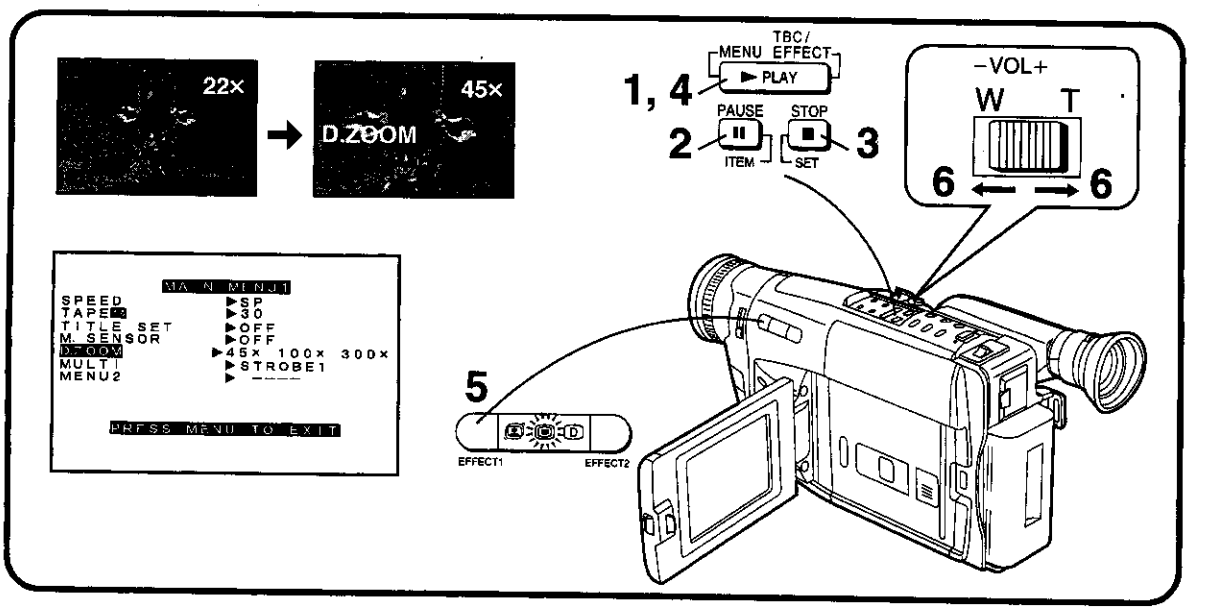
Cancelling the Super Image Stabilizer Function also resets the shutter speed to 1/50 s. However, after selecting the Sports Mode or the Portrait Mode, cancelling the Super Image Stabilizer Function does not reset the shutter speed to 1/50 s.

■ In the Following Recording Conditions, the Picture Stabilizing Effect May Not Be Sufficient:

- Subjects with horizontal or vertical stripes
- Flat subjects
- Dark subjects (In this case, the [ ] Indication flashes. Increase the amount of light.)
- Subjects under many fluorescent lamps
- Fast-moving subjects
- Subjects with a flat background

■ When Using the Super Image Stabilizer Function, the Picture Changes as Follows:

- The picture quality deteriorates slightly.
- Under fluorescent lamps, the picture brightness may fluctuate and the colours may be unnatural.



Using the Digital Zoom Function

This function is convenient, when you record a very distant subject and want to enlarge it even further than is possible with the normal (optical) zoom function.

1 Press the [MENU] Button.

- The [MAIN MENU1] Menu appears.

2 Press the [ITEM] Button repeatedly to select [D.ZOOM].

3 Press the [SET] Button to select the desired digital zoom range (up to 45×, up to 100× or up to 300×).

4 Press the [MENU] Button to exit the menu.

5 Press the [EFFECT1] Button repeatedly until the [D.ZOOM] Indication appears.

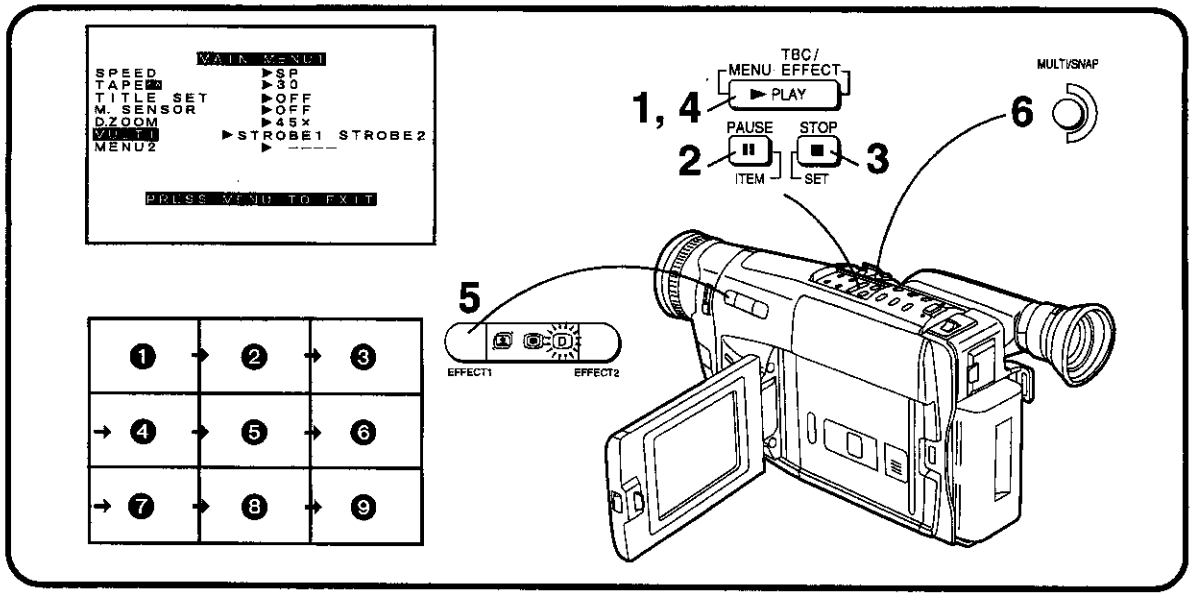
- The Digital Zoom Indication Lamp [◎] lights.

6 Push the [W•T] Zoom Lever toward [T] or [W] to zoom in or out as desired.

- With the Digital Zoom Function activated, you can optically zoom between 1× (wide-angle) and 22× and digitally between 23× and 300×. The changeover between optical and digital zooming is automatic.
- When using the Digital Zoom Function, the picture quality is somewhat reduced.
- Within the digital zoom range (23×–300×), it is not possible to adjust the white balance manually or to cancel the manually adjusted white balance setting.

Cancelling the Digital Zoom Function

Press the [EFFECT1] Button repeatedly until the [D.ZOOM] Indication disappears. Or, keep the [EFFECT1] Button pressed for more than 2 seconds to make the [D.ZOOM] Indication disappear.



Displaying 9 Small Still Pictures on the Screen (Multi Image)

The Multi Image Mode lets you divide the screen into 9 small fields. You can then fill them with still pictures using the Multi Image Strobe 1 Mode (explained below) or the Multi Image Strobe 2 Mode (➔ 54). You can use these functions in the Recording, Recording Pause, or Playback Stop Mode.

■ Capturing and Displaying a Sequence of 9 Still Pictures (Multi Image Strobe 1 Mode)

This function captures and displays a sequence of 9 still pictures over approximately 1.5 seconds. This is very convenient for motion analysis of sports action, animal studies, etc.

1 Press the [MENU] Button.
- The [MAIN MENU1] Menu appears.

2 Press the [ITEM] Button repeatedly to select [MULTI].

3 Press the [SET] Button to select [STROBE1].

4 Press the [MENU] Button to exit the menu.

5 Press the [EFFECT1] Button repeatedly until the [MULTI] Indication appears.
- The Digital Effect Indication Lamp [ⓓ] lights.

6 Press the [MULTI] Button at the scene that you want to capture as a sequence of 9 still pictures.
- A sequence of 9 still pictures appears.

Erasing the 9 Still Pictures

Press the [MULTI] Button.

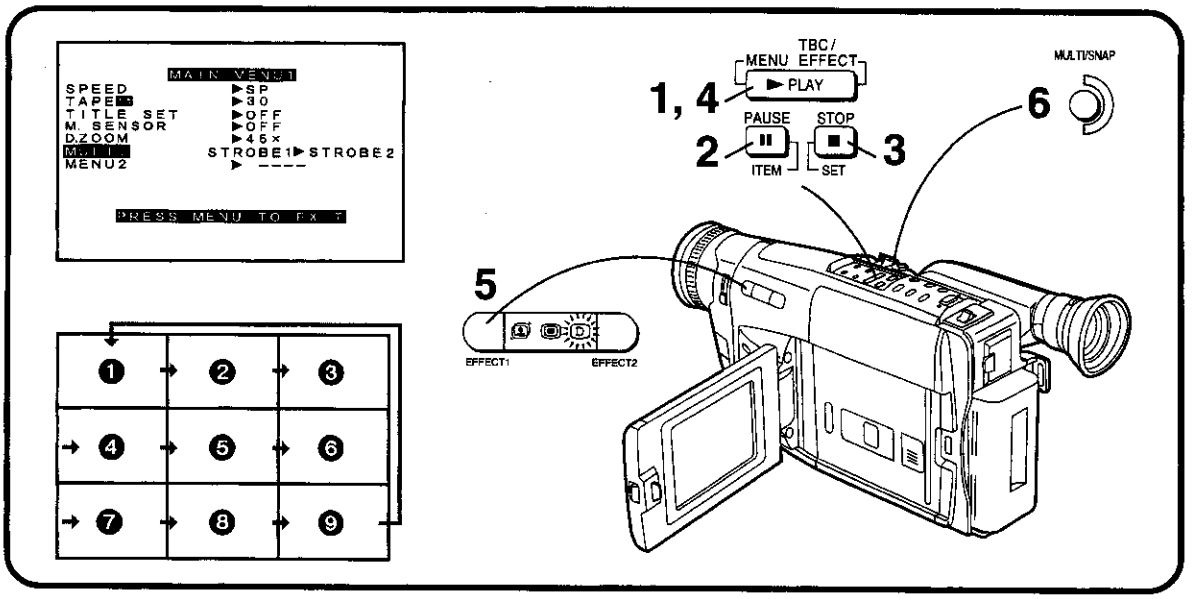
If you press the [MULTI] Button again, another sequence of 9 still pictures is captured and displayed.

Cancelling the Multi Image Mode

Press the [EFFECT1] Button repeatedly to make the [MULTI] Indication disappear.

Or, keep the [EFFECT1] Button pressed for more than 2 seconds to make the [MULTI] Indication disappear.

- If you press the [MULTI] Button during recording, a small noise may also be recorded.
- The Sepia or Black & White Modes cannot be used for the displayed 9 still pictures (even though these indications may appear).



Displaying 9 Small Still Pictures on the Screen (Multi Image) (Continued)

■ Continuously Capturing and Displaying 9 Still Pictures (Multi Image Strobe 2 Mode)

This function continuously captures and displays sequences of 9 still pictures taken over approximately 1.5 seconds each.

1 Press the [MENU] Button.
- The [MAIN MENU1] Menu appears.

2 Press the [ITEM] Button repeatedly to select [MULTI].

3 Press the [SET] Button to select [STROBE2].

4 Press the [MENU] Button to exit the menu.

5 Press the [EFFECT1] Button repeatedly until the [MULTI] Indication appears.
- The Digital Effect Indication Lamp [ⓓ] lights.

6 Press the [MULTI] Button at the scene that you want the Multi Image Strobe 2 Function to start.
- Sequences of 9 still pictures are continuously displayed until you press the [MULTI] Button again.

Erasing the 9 Still Pictures

After pressing the [MULTI] Button to stop the capturing and displaying of sequences of 9 pictures, press the [MULTI] Button again.

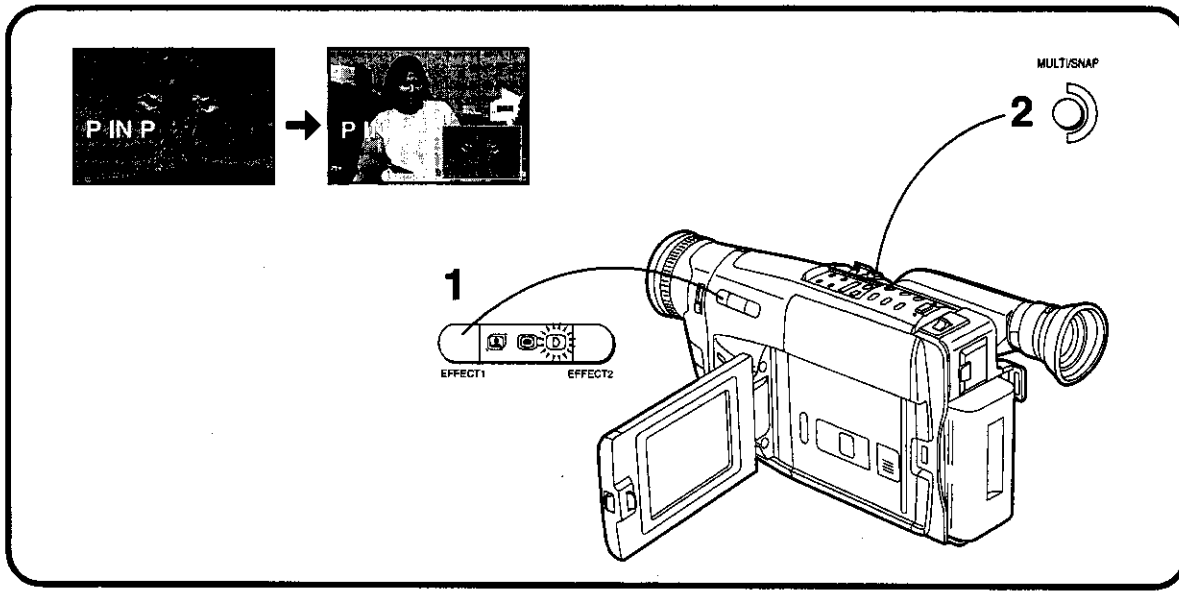
If you press the [MULTI] Button once more, the capturing and displaying of sequences of 9 pictures starts again.

Cancelling the Multi Image Mode

Press the [EFFECT1] Button repeatedly to make the [MULTI] Indication disappear.

Or, keep the [EFFECT1] Button pressed for more than 2 seconds to make the [MULTI] Indication disappear.

- If you press the [MULTI] Button during recording, a small noise may also be recorded.
- The Sepia and Black & White Modes cannot be used for the displayed sequences of 9 still pictures (even though these indications may appear).



Displaying a Small Still Picture Inside the Normal Picture (Picture-in-Picture)

This function lets you display a small still picture inside the normal picture. Therefore, you can write, draw, print, etc. a title, and then capture and insert it as small still picture. You can use this function in the Recording, Recording Pause, or Playback Stop Mode.

1 Press the [EFFECT1] Button repeatedly until the [P IN P] Indication appears.

- The Digital Effect Indication Lamp [ⓓ] lights.

2 Aim the Movie Camera at the scene or subject that you want to capture as small still picture and press the [MULTI] Button.

- A small picture appears inside the normal picture.

Erasing the Small Picture

Press the [MULTI] Button.

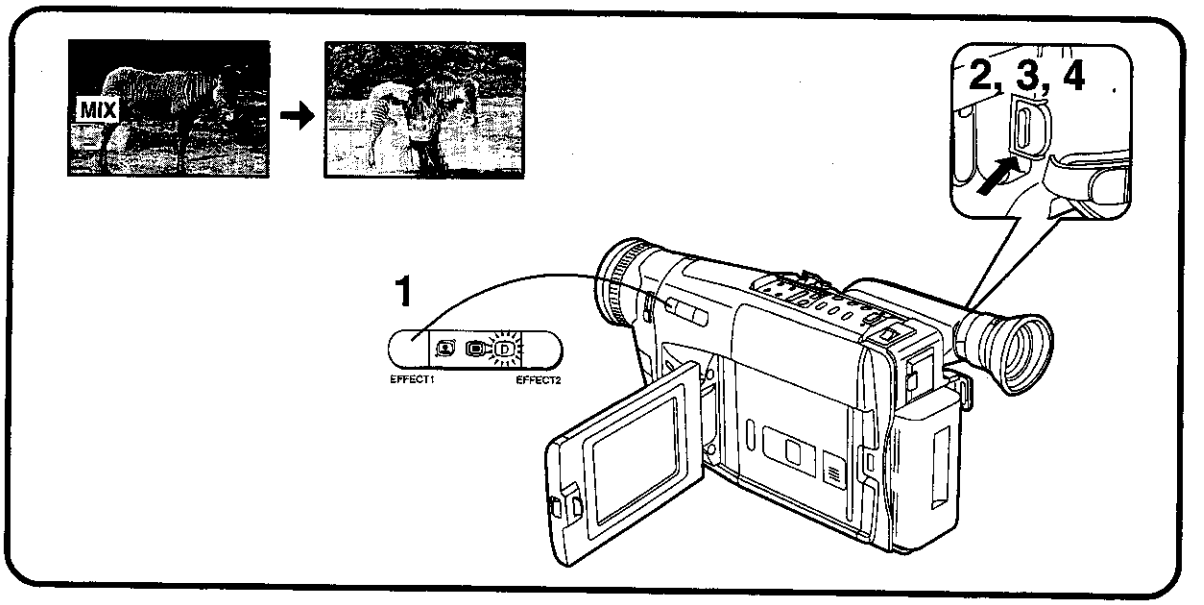
If you press the [MULTI] Button again, another small picture is displayed.

Cancelling the Picture-in-Picture Mode

Press the [EFFECT1] Button repeatedly to make the [P IN P] Indication disappear.

Or, keep the [EFFECT1] Button pressed for more than 2 seconds to make the [P IN P] Indication disappear.

- If you press the [MULTI] Button during recording, a small noise may also be recorded.
- The Sepia or Black & White Mode cannot be used for the small picture inside the normal picture (even though these indications may appear).



Mix Function

It gradually fades out a still picture of the last recorded scene while fading in the moving picture of the new scene.

1 Press the [EFFECT1] Button repeatedly until the [MIX] Indication appears.

- The Digital Effect Indication Lamp [ⓓ] lights.

2 Press the Recording Start/Stop Button to start recording normally.

3 Press the Recording Start/Stop Button to stop recording the scene.

- The Movie Camera is in the Recording Pause Mode.
- The [MIX] Indication changes to [MIX] to indicate that the last picture of the just recorded scene is stored in the digital image memory.

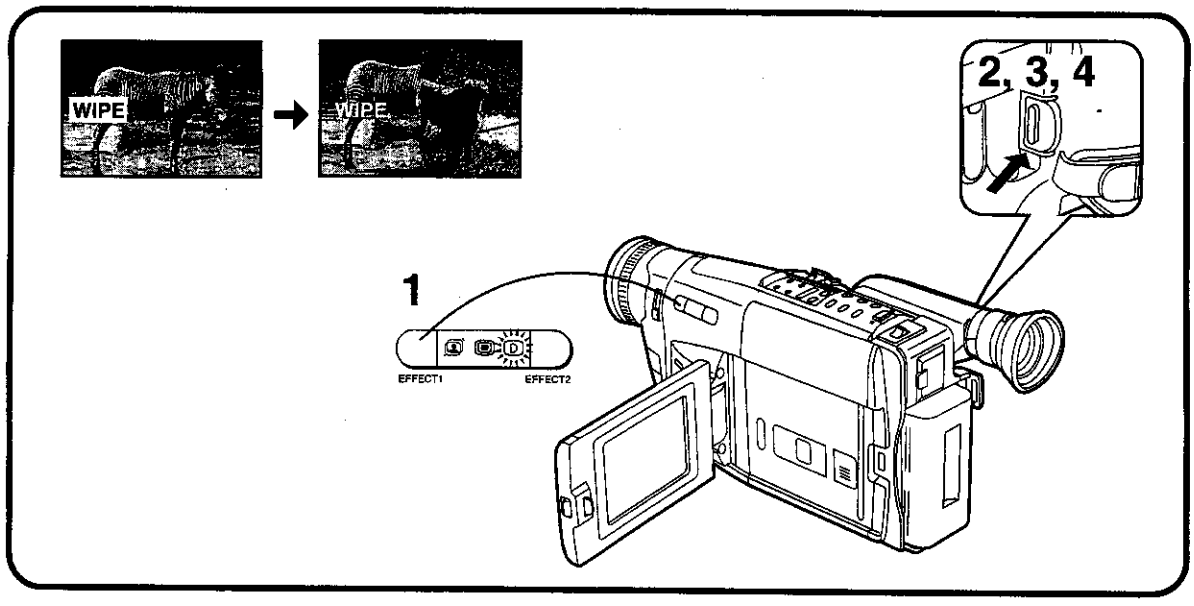
4 Press the Recording Start/Stop Button to start recording the next scene.

- First the still picture (from the digital image memory) appears, and it then gradually disappears while the moving picture of the new scene gradually appears.
- All subsequent scene-to-scene transitions will be recorded with this Mix Effect until you cancel the Mix Function.

Cancelling the Mix Function

Press the [EFFECT1] Button repeatedly to make the [MIX] Indication disappear.
Or, press the [EFFECT1] Button for more than 2 seconds to make the [MIX] Indication disappear.

- The Negative and Solarisation Effects cannot be applied to a picture stored in the digital image memory for the Mix Function.
- The Mix Mode cannot be used together with the Snapshot Mode or any of the Digital Fade Modes.



Wipe Function

It gradually replaces a still picture of the last recorded scene with the moving picture of the new scene, like drawing a curtain.

1 Press the [EFFECT1] Button repeatedly until the [WIPE] Indication appears.

- The Digital Effect Indication Lamp [ⓓ] lights.

2 Press the Recording Start/Stop Button to start recording normally.

3 Press the Recording Start/Stop Button to stop recording the scene.

- The Movie Camera is in the Recording Pause Mode.
- The [WIPE] Indication changes to [WIPE] to indicate that the last picture of the just recorded scene is stored in the digital image memory.

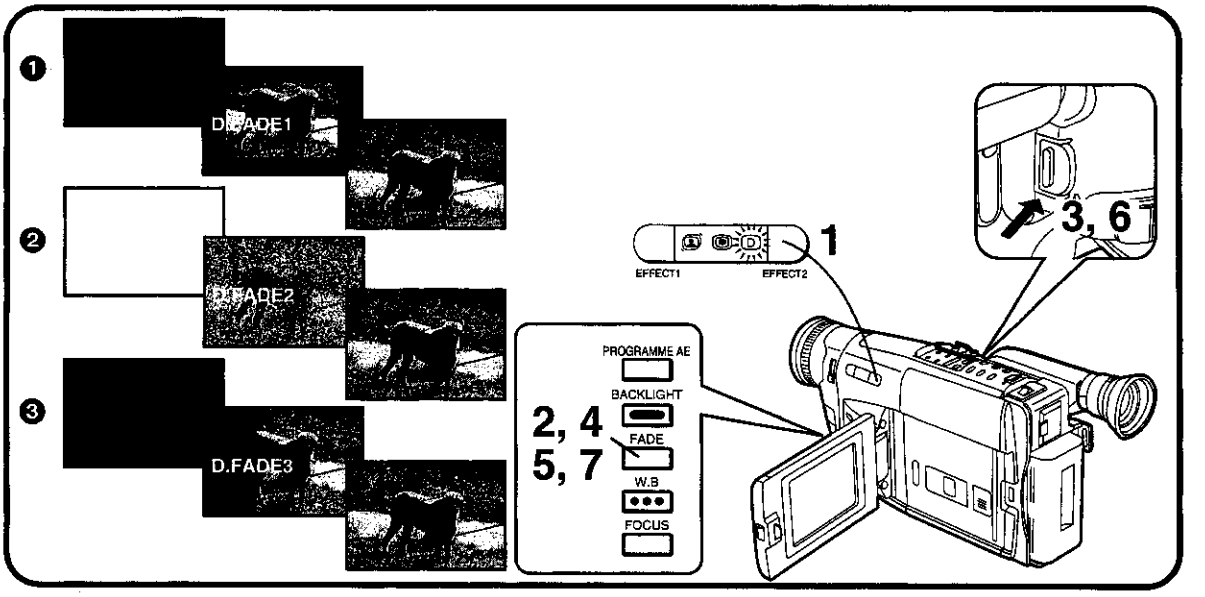
4 Press the Recording Start/Stop Button to start recording the next scene.

- First, the still picture (from the digital image memory) appears and it is then gradually replaced by the moving picture of the new scene, starting from the right.
- All subsequent scene-to-scene transitions will be recorded with this Wipe Effect until you cancel the Wipe Function.

Cancelling the Wipe Function

Press the [EFFECT1] Button repeatedly to make the [WIPE] Indication disappear.
Or, press the [EFFECT1] Button for more than 2 seconds to make the [WIPE] Indication disappear.

- The Negative and Solarisation Effects cannot be applied to a picture stored in the digital image memory for the Wipe Function.
- The Wipe Mode cannot be used together with the Snapshot Mode or any of the Digital Fade Modes.



Digital Fade

There are 3 Digital Fade Modes available.

❶ **Digital Fade 1 [D.FADE1]**

❷ **Digital Fade 2 [D.FADE2]**

❸ **Digital Fade 3 [D.FADE3]**

1 Press the [EFFECT2] Button repeatedly until the desired Digital Fade Indication appears.

- The Digital Effect Indication Lamp [ⓓ] lights.

■ **Fading In**

2 With the Movie Camera in the Recording Pause Mode, keep the [FADE] Button pressed.

- The picture disappears gradually with the selected digital fade effect.

3 When the picture has completely disappeared, press the Recording Start/ Stop Button to start recording.

4 Approximately 3–4 seconds later, release the [FADE] Button.

■ **Fading Out**

5 During recording, press the [FADE] Button at the point where you want to fade out, and keep it pressed.

6 After the picture has completely disappeared, press the Recording Start/ Stop Button to stop recording.

- The Movie Camera is now in the Recording Pause Mode.

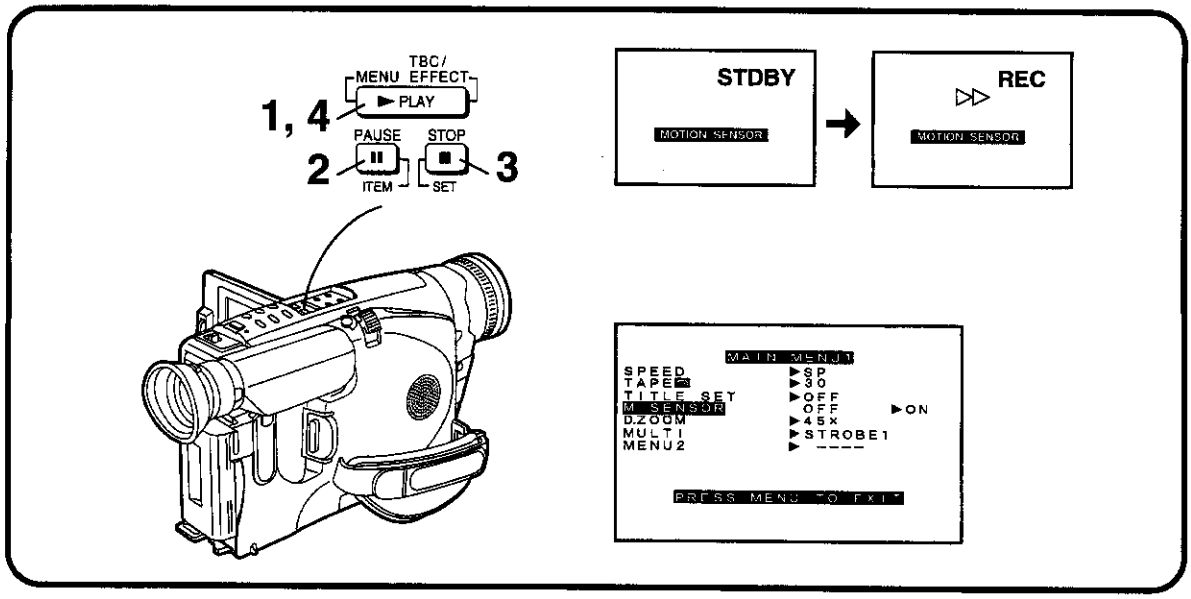
7 Release the [FADE] Button.

Cancelling the Selected Digital Fade Function

Press the [EFFECT2] Button repeatedly until none of the Digital Fade Indications are displayed any more. Or, press the [EFFECT2] Button for more than 2 seconds to make the Digital Fade Indication disappear.

It is not possible to use any of the Digital Fade Functions together with the Multi Image Mode, Picture-in-Picture Mode, Mix Mode or Wipe Mode.

(➔ 53, 55, 56, 57)



Motion-Sensor-Controlled Recording

In this mode, recording automatically starts when the built-in Motion Sensor detects some movement in the picture.

1 Press the [MENU] Button.
- The [MAIN MENU1] Menu appears.

2 Press the [ITEM] Button repeatedly to select [M.SENSOR].

3 Press the [SET] Button to select [ON].

4 Press the [MENU] Button to exit the menu.
- The Motion Sensor Function Stand-by [STDBY] Indication appears.

- Approximately 1 second after the Movie Camera's Motion Sensor has detected movement in the picture, recording automatically starts. Approximately 10 seconds after movement in the picture has stopped, recording automatically stops and the Movie Camera is in the Motion Sensor Stand-by Mode.
- When the Movie Camera remains in the Motion Sensor Stand-by Mode for more than 6 minutes, the Finder automatically turns off to conserve power. When the Motion Sensor again detects movement in the picture, recording automatically restarts after approximately 4 seconds and the Finder turns on.

Cancelling the Motion Sensor Function During Stand-by

Set [M.SENSOR] on the [MAIN MENU1] Menu to [OFF].

Cancelling the Motion Sensor Function During Recording

Press the Recording Start/Stop Button for 2 seconds.

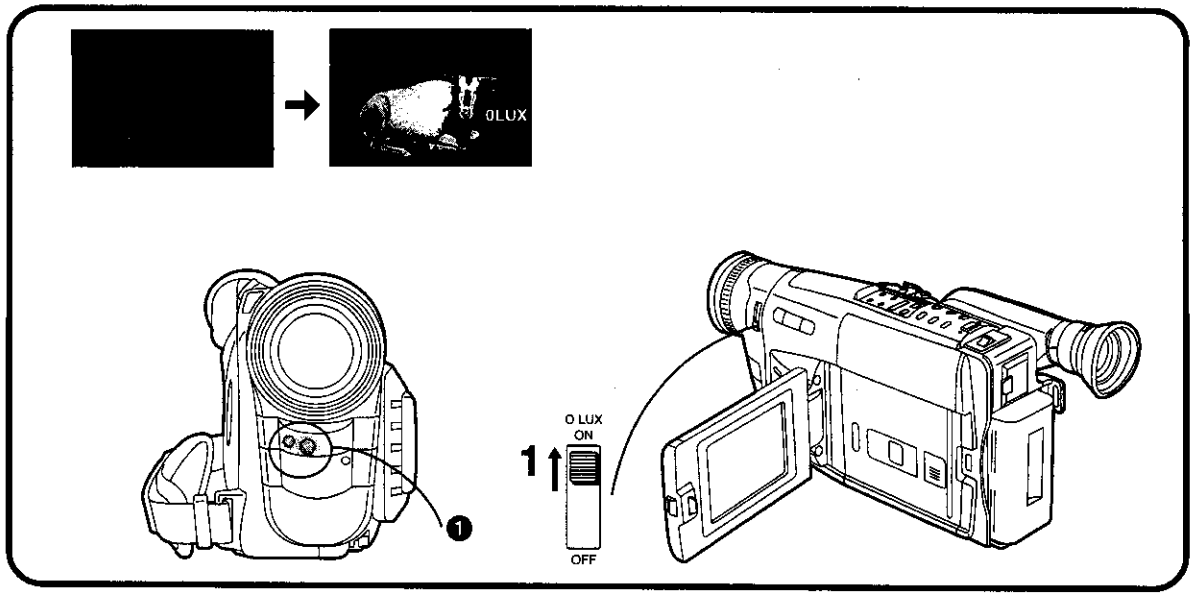
■ The Following Recording Situations Could Also Activate the Motion Sensor Function:

- A white wall or another single-colour background behind the subject.
- A subject with horizontal, vertical or oblique stripes.
- Sudden changes in the surrounding brightness.
- Exposure of the Movie Camera to slight shocks or vibration.
- Recording in a dimly lit place. (The [MOTION SENSOR] Indication flashes.)

■ The Following Recording Situations May Not Activate the Motion Sensor:

- Extremely slow or fast movement of the subject.
- Very little movement of the subject.
- Recording in a dimly lit place. (The [MOTION SENSOR] Indication flashes.)
- A very small subject.
- Movement of the subject near the edge of the picture.
- A background with horizontal or vertical stripes.

- To prevent accidental recording start caused by Movie Camera movement, the Movie Camera should be mounted on a tripod or be otherwise secured in a very stable position.
- When you put the Movie Camera in the Motion Sensor Stand-by Mode, the selected digital effects are all cancelled.
- When the Movie Camera is in the Motion Sensor Function Stand-by Mode, it is not possible to manually start recording by pressing the Recording Start/Stop Button or to activate the Super Image Stabilizer, Digital Zoom, Digital Effect, Recording Check, or Camera Search Function.
- When you use the AC Adaptor to power the Movie Camera, the Motion Sensor Function Stand-by Mode will continue when no movement is detected in the picture, even when the tape has reached the end during recording. Therefore, we recommend that you check the tape within a week. When you use the Battery to power the Movie Camera, it remains in the Motion Sensor Function Stand-by Mode until the Battery is discharged, at which time the [CAMERA] Lamp flashes for a few seconds.
- To ensure correct functioning of the Motion Sensor Function, the moving subject should be quite large in the picture. Therefore, when you have zoomed the lens to the maximum wide-angle position, the distance between lens and subject should preferably be within about 2 metres. For subjects at larger distances, be sure to zoom in accordingly.
- The Movie Camera requires time to set up before recording starts. Therefore, the beginning of movement is not recorded.
- If there is a power interruption, the Motion Sensor Function is cancelled.
- If an Error Code (→ 93) appears, the Motion Sensor Function is cancelled.



Recording in Dark Places Without Any Illumination

(0 Lux Night View Function)

This function is convenient when you want to record at night in places without any illumination, for example for observing the behaviour of nocturnal animals, etc. In this mode, the Movie Camera emits infrared rays which makes it possible to record subjects that are invisible to the naked eye.

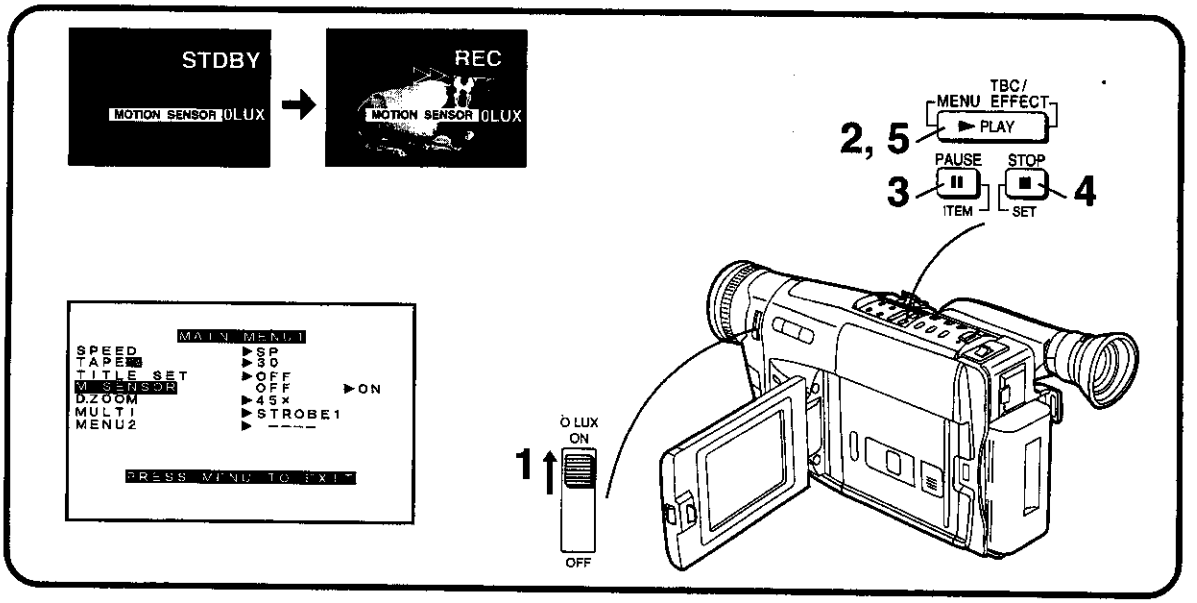
1 Set the [0 LUX ON/OFF] Switch to [ON] to make the [0LUX] Indication appear.

- The built-in Infra-red Beam Emitters ❶ light. Be careful not to cover them with your hand when recording.

- Do not use the 0 Lux Night View Function in brightly lit places and never aim the Movie Camera against the sun, as this could cause irreparable damage.
- The playback picture of scenes recorded with the 0 Lux Night View Function will be in black and white.
- If you change the setting of the [0 LUX ON/OFF] Switch during recording, a switching noise is also recorded.
- When recording with the 0 Lux Night View Function, it is not possible to adjust the white balance manually or to cancel the manually adjusted white balance setting.
- It is not possible to use any of the Programme AE Modes when the 0 Lux Night View Mode is activated.
- When using the 0 Lux Night View Function, the subject should be within 3 metres from the Movie Camera.
- When the automatic focusing is not precise, adjust the focus manually.
- If you do not want the Tally Lamp to light during recording using the 0 Lux Night View Function, set [TALLY LAMP] on the [MAIN MENU2] Menu to [OFF].
- As the iris is fully opened in the 0 Lux Night View Mode, subjects in white or other light colours may be recorded whitish, blurred and with weak contrast.

Cancelling the 0 Lux Night View Function

Set the [0 LUX ON/OFF] Switch to [OFF] to make the [0LUX] Indication disappear.



Using the 0 Lux Night View Function together with the Motion-Sensor-Controlled Recording Function in Dark Places without Any Illumination

If you use the 0 Lux Night View Function together with the Motion-Sensor-Controlled Recording Function, recording starts automatically when the Movie Camera's built-in Motion Sensor detects some movement in the picture. This combined function is convenient for easy, unattended animal observation recordings at night.

1 **Set the [0 LUX ON/OFF] Switch to [ON] to make the [0LUX] Indication appear.**

2 **Press the [MENU] Button.**
- The [MAIN MENU1] Menu appears.

3 **Press the [ITEM] Button repeatedly to select [M.SENSOR].**

4 **Press the [SET] Button to select [ON].**

5 **Press the [MENU] Button to exit the menu.**
- The Motion Sensor Function Stand-by [STDBY] Indication appears.

Cancelling the 0 Lux Night View Function and Motion-Sensor-Controlled Recording Function during Stand-by

Set [M.SENSOR] on the [MAIN MENU1] Menu to [OFF] and then set the [0 LUX ON/OFF] Switch to [OFF].

Cancelling the 0 Lux Night View Function and Motion-Sensor-Controlled Recording Function during Recording

Press the Recording Start/Stop Button for more than 2 seconds and then set the [0 LUX ON/OFF] Switch to [OFF].

If you use the Motion Sensor Function together with the 0 Lux Night View Function, the [MOTION SENSOR] Indication flashes, and recording may not be possible in some cases.

Subjects and Recording Conditions for Which the Manual Mode Is More Suitable

The following subjects and recording situations are not suitable for recording in the Full Auto Mode. In these cases, adjusting the white balance and/or focus manually will provide more beautiful pictures. Also read the pages related to the manual adjustment indicated in parentheses.

1. **White Balance**

   To adjust the white balance manually, see "Recording with Manual White Balance Adjustment". **(➔ 64)**

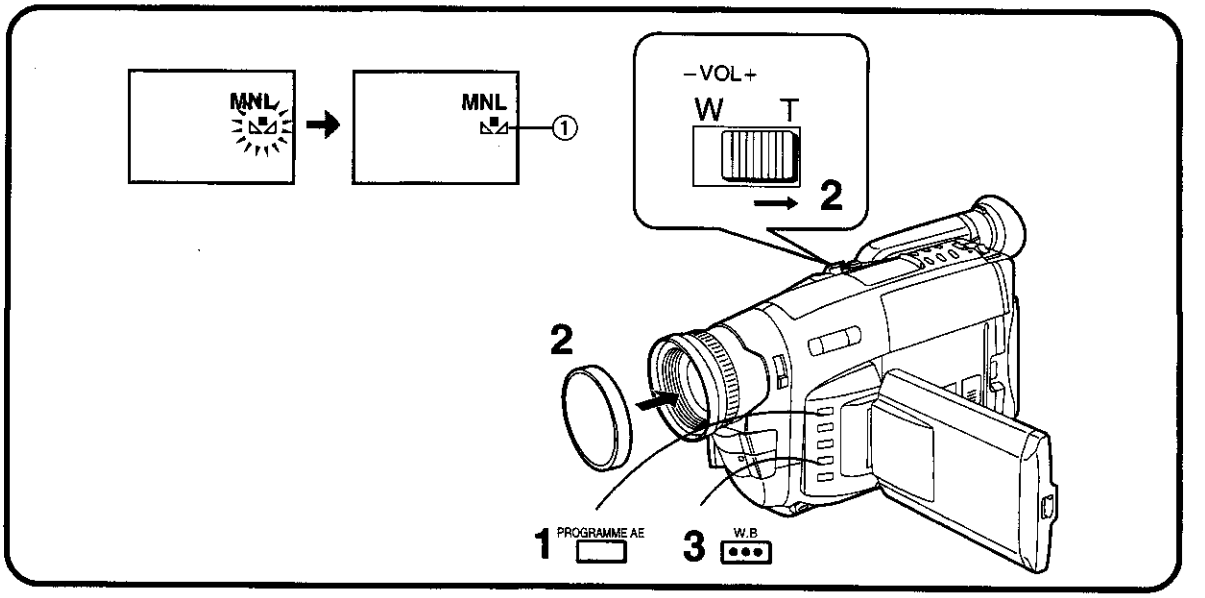
2. **Focus**

   To adjust the focus manually, see "Recording with Manual Focus Adjustment". **(➔ 66)**

- During recording, it is not possible to change the recording mode ([AUTO], [ ], [ ], [ ], [ ], [ ]), even if you press the [PROGRAMME AE] Button. **(➔ 67)**

■ Subjects and Recording Conditions Not Suitable for Recording in the Full Auto Mode (problematic adjustments in parentheses)

- Subjects with dark surfaces (White Balance, Focus)
- When moving the Movie Camera from outdoors to indoors while recording (White Balance)
- Subjects lit by different light sources (White Balance)
- Subjects lit by mercury-vapour or natrium lamps (White Balance)
- Subjects with shiny surfaces or a lot of light reflection (Focus)
- Subjects with weak contrast (Focus)
- Subjects with part of it near and part of it far away from the Movie Camera (Focus)
- Subjects without vertical contours (Focus)
- Subjects with fast movement (Focus)
- Subjects behind moving objects (Focus)
- Subjects behind glass covered by dirt, dust or water drops (Focus)



Recording with Manual White Balance Adjustment

With this Movie Camera, you can also adjust the white balance manually.
Use this mode for special subjects and recording conditions, such as listed (➔ 63), for which the Full Auto Mode is not suitable, and for light sources outside the range ❶ (➔ 65). Use it also when you want to manually adjust the white balance for each new scene as professionals do.

1 Press the [PROGRAMME AE] Button repeatedly until an indication other than [AUTO] appears.

2 Attach the White Lens Cap and zoom in until the entire screen is white.

3 Aim the Movie Camera at the subject that you want to record and then keep the [W.B] Button pressed until the [▣◿] Indication ① stops flashing and remains lit.

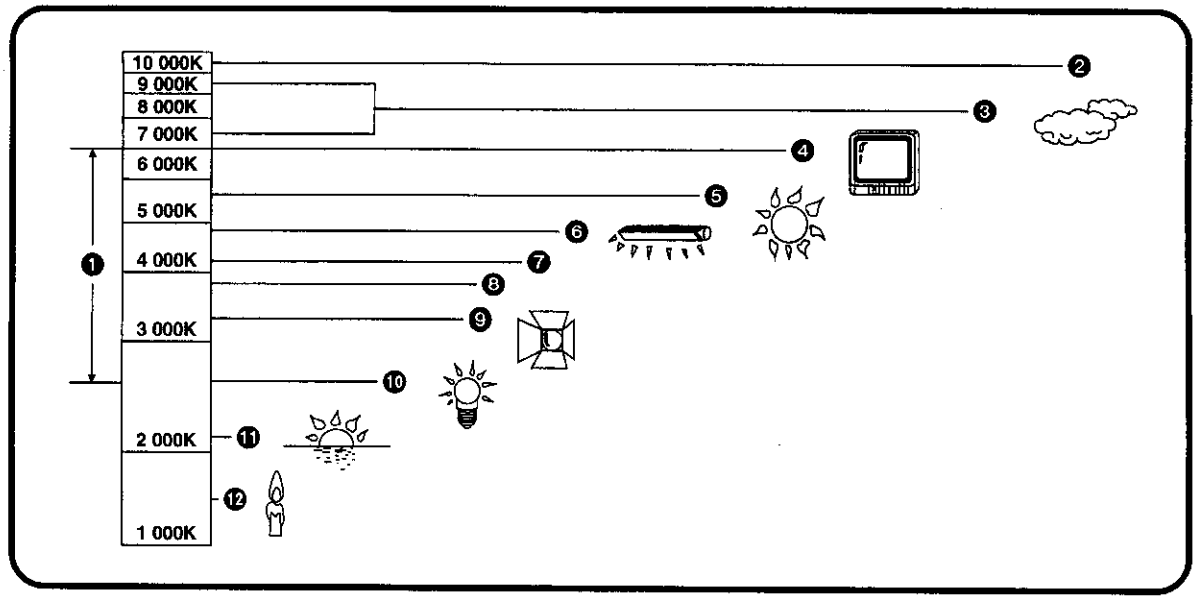
- When the Sepia Mode or Black & White Mode, Gain-up Mode or 0 Lux Night View Mode is used, it is not possible to manually adjust the white balance or to cancel the manually adjusted white balance setting even if you press the [W.B] Button.

In the following cases, the [▣◿] Indication flashes:

- During manual adjustment of the white balance. (If the surroundings are dark and the white balance cannot be adjusted, the [▣◿] Indication keeps flashing.)
- When the previously set white balance setting is maintained.
- When you are trying to adjust the white balance in the digital zoom range (23×–300×). (In this case, first adjust the white balance in the optical zoom range (1×–22×) and then zoom back to within the Digital Zoom Mode.)

Cancelling the Manual White Balance Mode

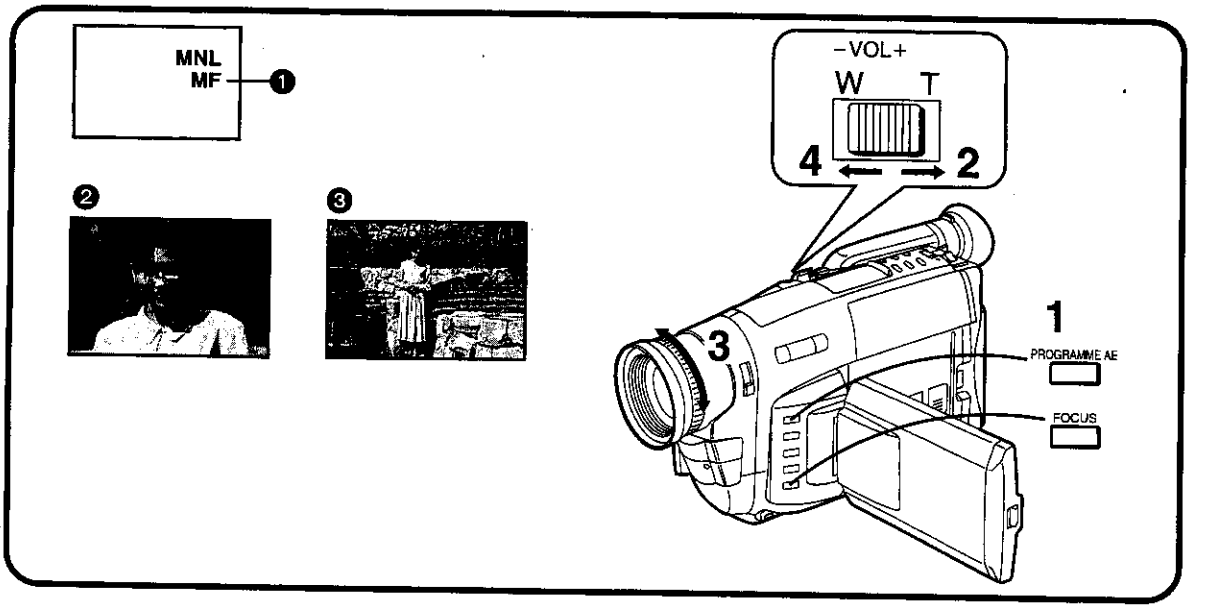
Press the [W.B] Button once. Or, press the [PROGRAMME AE] Button repeatedly until the [AUTO] Indication appears.



Colour Temperature and White Balance Adjustment

Every light source has its own colour temperature which is measured in Kelvin (K). The higher the Kelvin value, the more bluish the light; the lower the value, the more reddish the light. The Kelvin value is related to the tint of the light, but not directly to its brightness.
The range ❶ indicated in the illustration above shows the light sources for which this Movie Camera can provide precise white balance adjustment and, therefore, natural colours in the recorded pictures, when using the Full Auto Mode. For light sources outside this range, adjust the white balance manually. **(➔ 64)** Also, additional lighting may be necessary.

❶ Control range of this Movie Camera's Auto White Balance Adjustment Mode
❷ Blue sky
❸ Cloudy sky (Rain)
❹ TV screen
❺ Sunlight
❻ White fluorescent lamp
❼ 2 hours after sunrise or before sunset
❽ 1 hour after sunrise or before sunset
❾ Halogen light bulb
❿ Incandescent light bulb
⓫ Sunrise or sunset
⓬ Candlelight



Recording with Manual Focus Adjustment

With this Movie Camera, you can also adjust the focus manually.

Use this mode for special subjects and recording conditions, such as listed (➔ **63**), for which the Full Auto Mode is not suitable.

1 Press the [PROGRAMME AE] Button repeatedly until an indication other than [AUTO] appears.

2 Keep the [W•T] Zoom Lever pushed toward [T] to zoom in on the subject ❷.

- Zooming in on the subject before adjusting the focus ensures that the subject remains precisely focused even when you later zoom out ❸.

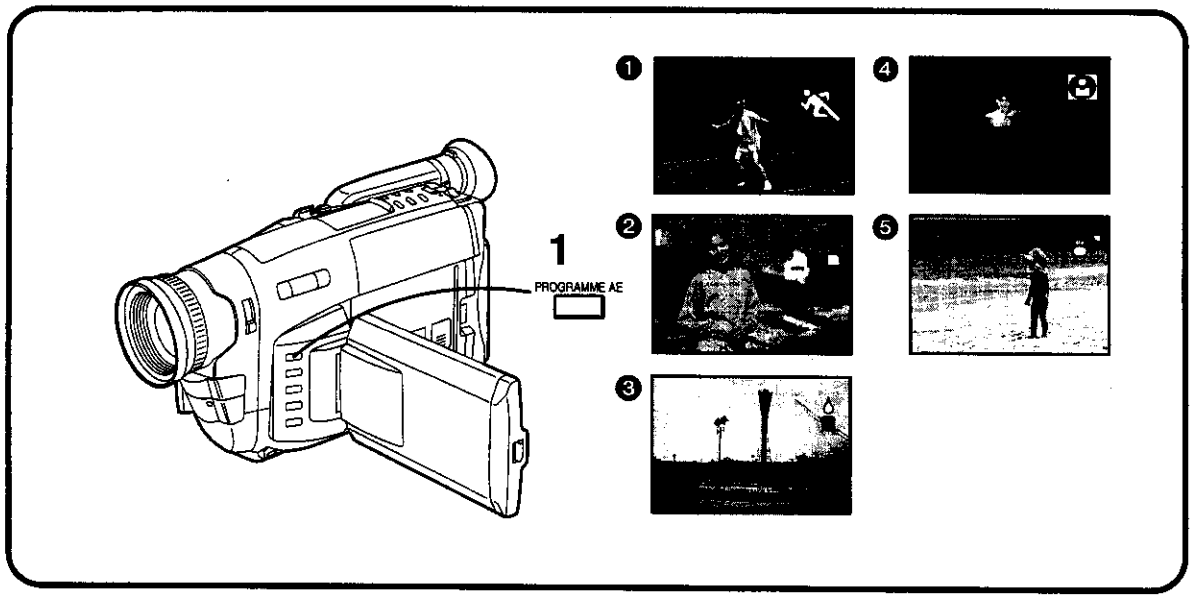
3 Turn the Focus Ring to adjust the focus.

- This activates the Manual Focus Adjustment Function, and the [MF] Indication ❶ appears. ([MF] means Manual Focus.)
- Pressing the [FOCUS] Button after performing steps 1 and 2 above also activates the Manual Focus Adjustment Function, and the [MF] Indication appears even before you turn the Focus Ring.

4 Push the [W•T] Zoom Lever toward [W] to zoom out as desired.

Cancelling the Manual Focus Mode

Press the [FOCUS] Button once to make the [MF] Indication disappear. Or, press the [PROGRAMME AE] Button repeatedly until the [AUTO] Indication appears.



Recording in Special Situations

(Programme AE)

This Movie Camera gives you a choice of 5 different automatic exposure programmes optimized for typical recording situations.

1 Press the [PROGRAMME AE] Button repeatedly until the indication of the desired mode ([ ], [ ], [ ], [ ] or [ ]) appears.

❶ Sports Mode [ ]

To record scenes with fast-moving subjects such as sports scenes.

❷ Portrait Mode [ ]

To make subjects stand out sharply from the background.

❸ Low Light Mode [ ]

To record dark scenes more brightly.

❹ Spotlight Mode [ ]

To record subjects under spotlights (party, theatre, etc.).

❺ Surf & Snow Mode [ ]

To record subjects in brightly lit surroundings (ski slopes, beach, etc.).

- During recording, it is not possible to change the recording mode ([AUTO], [MNL], [ ], [ ], [ ], [ ], [ ]), even if you press the [PROGRAMME AE] Button.
- It is not possible to use any of the Programme AE Modes when the 0 Lux Night View Mode is activated.

Cancelling the Selected Programme AE Function

Press the [PROGRAMME AE] Button repeatedly until none of the above indications are displayed.

Sports Mode

- When playing back on a VCR scenes that you have recorded in the Sports Mode, you can enjoy slow motion and still playback of very sharp images with fine details.
- Avoid recording under fluorescent, mercury-vapour or natrium lamps as the colour and the brightness of the playback picture may fluctuate.
- When recording subjects lit by strong lights or with much light reflection, the playback picture may contain vertical streaks of light.
- When the scene is not sufficiently lit, the [ ] Indication flashes.
- When using this mode for recording indoors, the playback picture may flicker.

Portrait Mode

- When using this mode for recording indoors, the playback picture may flicker.

Low Light Mode

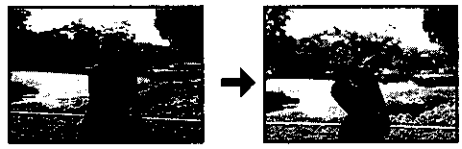
- It may not be possible to sufficiently brighten up extremely dark scenes.

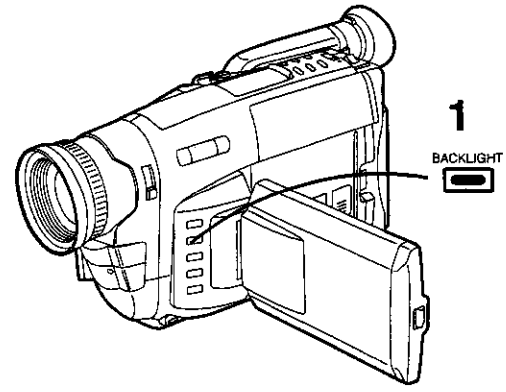
Spotlight Mode

- When using this mode, the recorded picture may be extremely dark.
- If a subject is extremely bright, the recorded picture may be whitish.

Surf & Snow Mode

- If a subject is extremely bright, the recorded picture may be whitish.





Recording Backlit Scenes

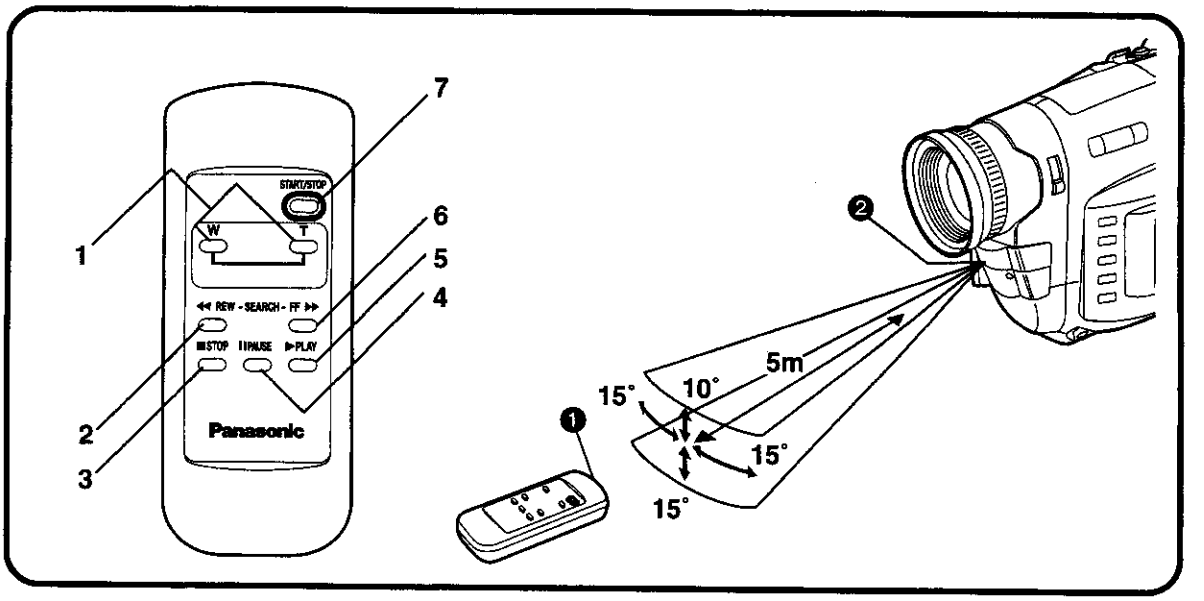
(Backlight Mode)

As a general rule, subjects should be lit from the front by sunlight or strong artificial light. However, if recording a backlit subject cannot be avoided, the Backlight Mode lets you brighten up the subject a little to prevent very dark faces, etc.

1 When recording a backlit scene, keep the [BACKLIGHT] Button pressed from before you press the Recording Start/Stop Button to start recording until after you press it again to stop recording.

■ When Using the Backlight Recording Function

- The sky may appear whitish.
- When recording with the sun striking the subject at an angle, star-shaped light reflections may be recorded in the picture.
- When recording a subject in front of a very bright background, the subject may still appear dark in the picture.
- In some cases, the subject may look clear, but the background may be overexposed (almost completely white). However, this is normal and not a malfunction.



Using the Remote Controller

The Remote Controller lets you take part in the action and control the recording operation from in front of the Movie Camera. It is also convenient for controlling the playback functions for playback via a TV or for dubbing.

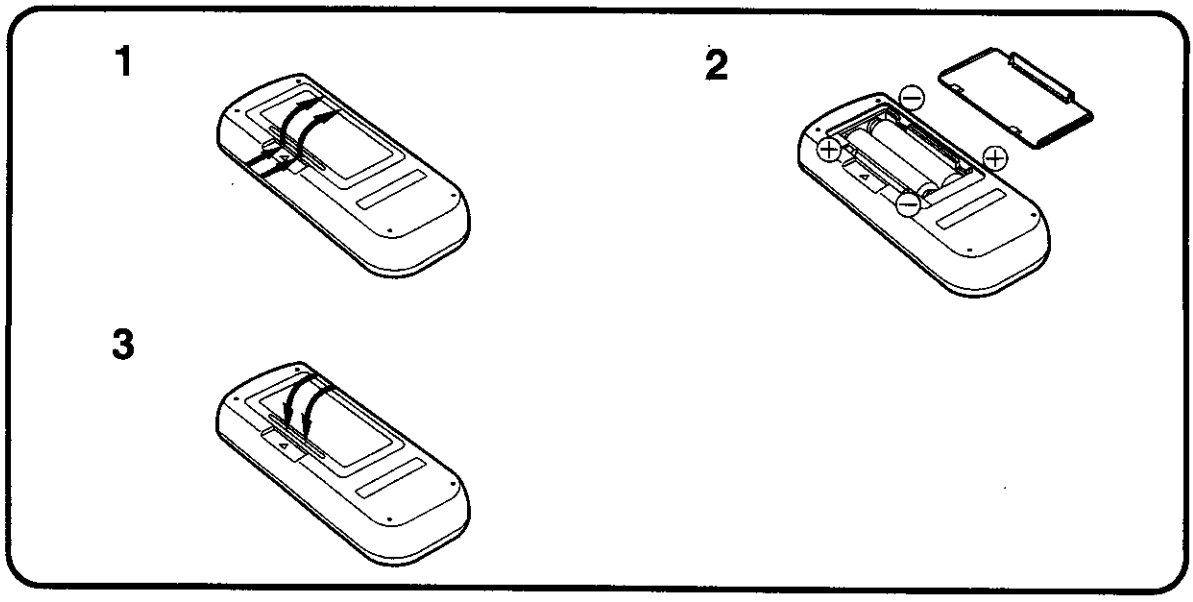
■ Buttons on the Remote Controller

The buttons with the same mark as on the Movie Camera generally have the same function.

1 **Zoom Buttons [W•T] (→ 33, 34, 35, 52)**
2 **Rewind Button [◀◀] (→ 32, 40, 41)**
3 **Stop Button [■] (→ 35)**
4 **Pause Button [❚❚] (→ 41)**
5 **Playback Button [▶] (→ 35)**
6 **Fast-forward Button [▶▶] (→ 32, 40, 41)**
7 **Recording Start/Stop Button [START/STOP] (→ 30)**

■ Conditions for Correct Operation of the Remote Controller

- The batteries must be inserted with the polarity (⊕ and ⊖) correctly aligned, and they must not be exhausted.
- The distance to the Movie Camera must not be more than 5 metres.
- The Transmitter Window ❶ on the Remote Controller or the Remote Control Sensor ❷ on the Movie Camera must not be exposed to direct sunlight and not be covered with clothes, etc.
- When operating the Zoom Function with the Remote Controller, it is not possible to vary the zooming speed. Also, there is a slight delay between pressing the Zoom Buttons on the Remote Controller and the mechanical zoom adjustment on the Movie Camera.



Inserting the Batteries into the Remote Controller

1. **Remove off the Battery Cover.**
2. **Insert the batteries with the polarity (⊕ and ⊖) correctly aligned.**
3. **Replace the Battery Cover.**

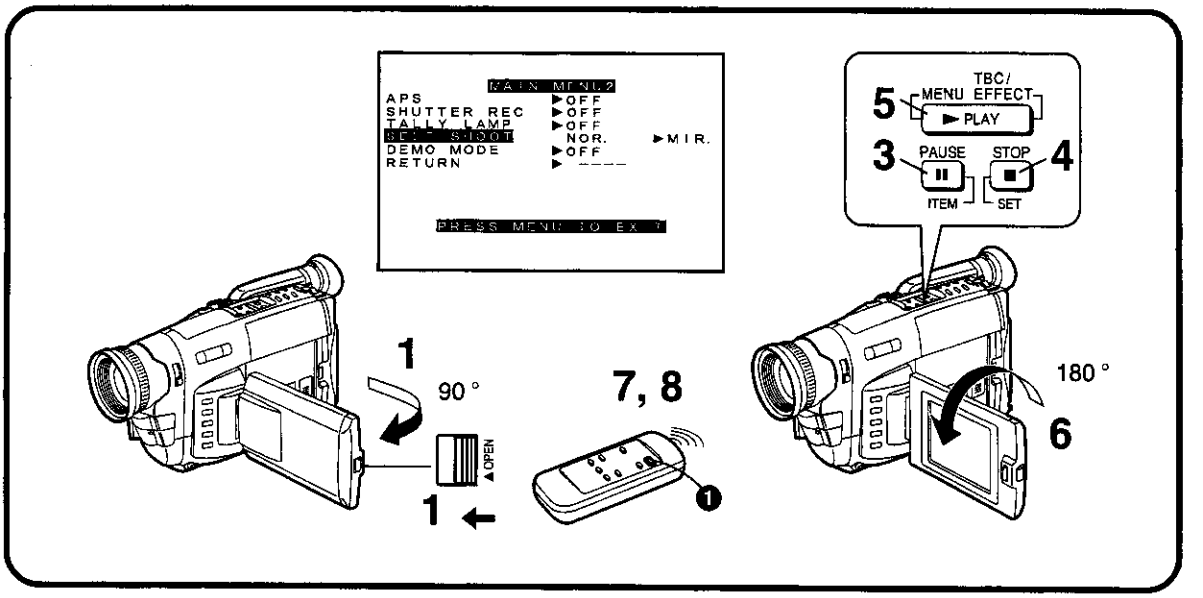
■ Replacing the Batteries

The life of the batteries is about 1 year.
When the batteries are exhausted, purchase two new "AAA", "UM-4" or "R03" type batteries and insert them in the same way as explained above.

- Do not mix old batteries with new batteries.
- Do not mix different battery types, i.e. Alkaline and Manganese.
- Do not use rechargeable (Ni-Cd) batteries.
- Do not short-circuit the batteries.
- When you do not use the remote controller for a long time, take out the batteries and store them in a cool, dry place.

CAUTION

Danger of explosion if batteries are incorrectly replaced. Replace only with the same or equivalent type recommended by the equipment manufacturer. Discard used batteries according to manufacturer's instructions.



Recording Yourself with the LCD Monitor Facing Forward

Turning the LCD Monitor so that it faces forward, allows you to aim the Movie Camera and view the picture in the Finder, while the persons in front of the camera can check the picture on the LCD Monitor during recording. If you mount the Movie Camera on a tripod and use the Remote Controller, you can also take part in the action that you are recording and check the picture from the front on the LCD Monitor.

1 **Slide the [▲OPEN] Lever to the left and simultaneously open the LCD Monitor in the direction of the arrow approximately 90°.**

2 **Display the [MAIN MENU2] Menu. (→ 16)**

3 **Press the [ITEM] Button repeatedly to select [SELF SHOOT].**

4 **Press the [SET] Button to select the desired mode ([NOR.] or [MIR.]).**
- [NOR.] means normal Mode.
- [MIR.] means mirror Mode. **(→ 73)**

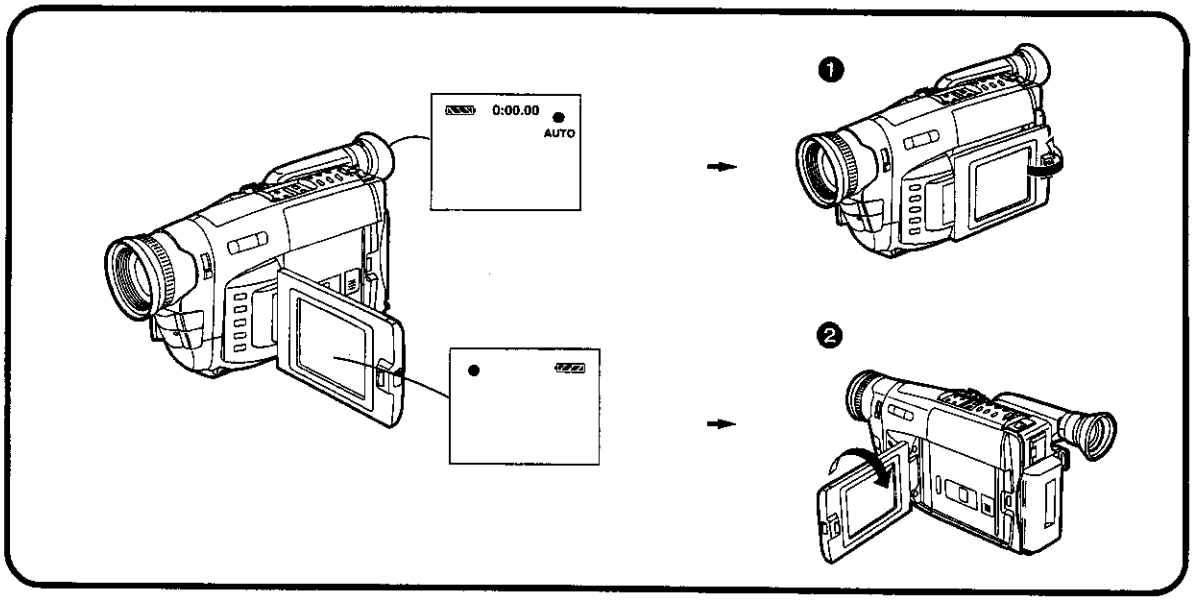
5 **Press the [MENU] Button to exit the menu.**

6 **Turn the LCD Monitor until it faces forward approximately 180°.**

7 **Press the Recording Start/Stop Button ❶.**

■ **Stopping Recording**

8 **Press the Recording Start/Stop Button ❶.**



■ Mirror Mode

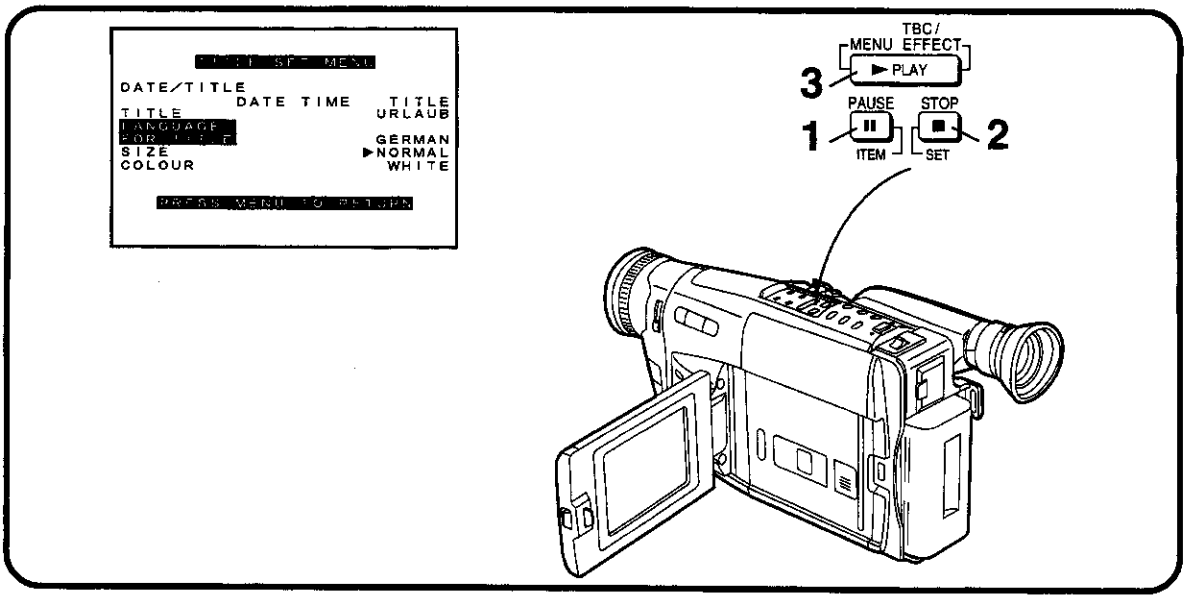
When recording yourself with the LCD Monitor facing forward, the picture shown on it the way it is being recorded may be difficult to get used to.
This is because we usually look at ourselves in the mirror, so we see a mirror-image and this feels more natural. This Movie Camera features the Mirror Mode which displays the picture as a mirror-image.
However, even if you have selected in the mirror Mode, the picture is recorded in the normal way.

In the Mirror Mode, only the following indications can be displayed on the LCD Monitor and in the Finder:

[●]: Recording Mode Indication
[❚❚●]: Recording Pause Mode Indication
[▭]: Remaining Battery Indication
[⚠]: General Warning/Alarm Indication
(In addition to these four indications, the Counter Indication and the Programme AE Mode Indications can also appear in the Finder.)

When you want to confirm other indications, return the LCD Monitor to position ❶ or ❷ shown in the illustration above.
Especially when the [⚠] Indication is displayed, be sure to return the LCD Monitor to position ❶ or ❷ so that you can confirm the actual Warning/Alarm Indication.

- If you turn the LCD Monitor so that it faces forward, the Finder also automatically turns on. However, in the following cases, the Finder turns off:
  - Pressing the [VCR/CAMERA] Button to switch the Movie Camera over to the VCR Mode.
  - Closing the LCD Monitor with the screen facing outward (as shown above ❶).
- It is not possible to display the Date, Time and/or Title Indication during recording in the Mirror Mode.



Recording with Pre-programmed Titles Inserted in the Picture

You can insert one of 10 pre-programmed titles in recordings of special occasions such as weddings and birthday parties. These titles are available in 8 languages.

Selecting the Desired Language

After displaying the [TITLE SET MENU] Menu... (→ 17)

1 Press the [ITEM] Button repeatedly to select [LANGUAGE FOR TITLE].

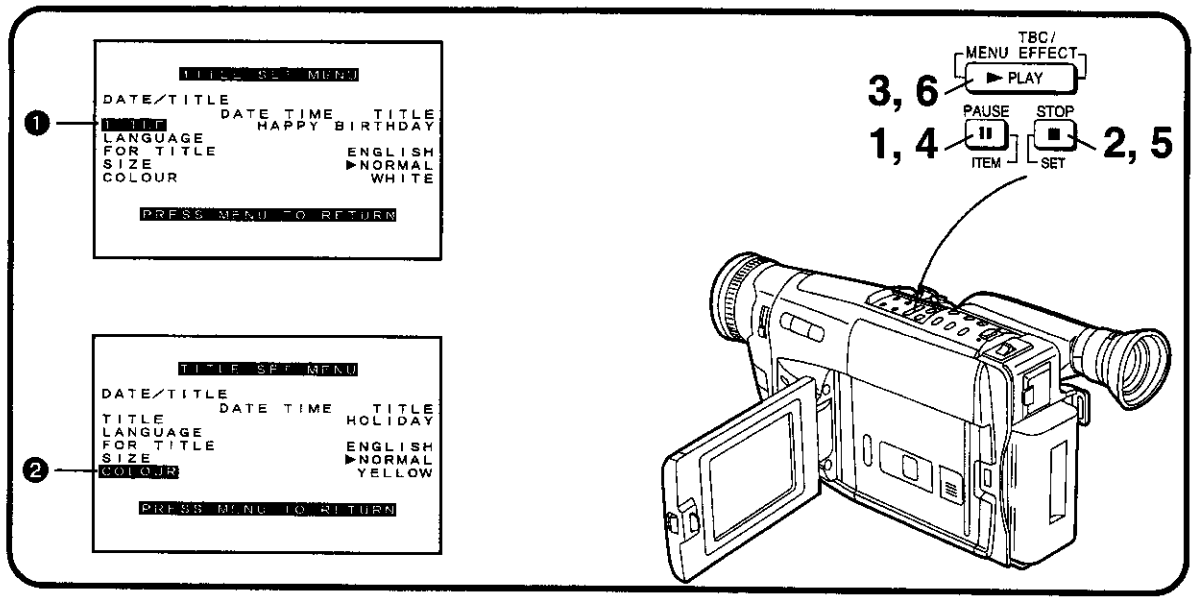
2 Press the [SET] Button to select the desired language.

- The languages change in the following order:

English → German → French → Italian → Spanish → Russian → Chinese → Arabic → English

3 Press the [MENU] Button twice to exit the menu.

The Date/Time/Title Indication remains displayed when you exit the Title Menu after having change the language of the title, the type of Date/Time/Title Indication **(→ 28)**, the title itself **(→ 75)**, the size of the title **(→ 76)** or the colour of the title **(→ 75)**.



Selecting the Desired Pre-programmed Title

After displaying the [TITLE SET MENU] Menu... (→ 17)

1 Press the [ITEM] Button repeatedly to select [TITLE] ❶.

2 Press the [SET] Button to select the desired title.

- The titles change in the order shown below. (In the other available languages, they are arranged in the same order.)

[HOLIDAY] ⟶ [HAPPY BIRTHDAY] ⟶ [WEDDING] ⟶ [FAMILY] ⟶ [PARTY] ⟶ [THE END] ⟶ [CONGRATULATIONS] ⟶ [MERRY CHRISTMAS] ⟶ [HAPPY MEMORIES] ⟶[HAPPY NEW YEAR] ⟶ [HOLIDAY] ⟶

3 Press the [MENU] Button twice to exit the menu.

Selecting the Desired Colour of the Pre-programmed Title

You can select the colour of the title from among 8 colours.

After displaying the [TITLE SET MENU] Menu... (→ 17)

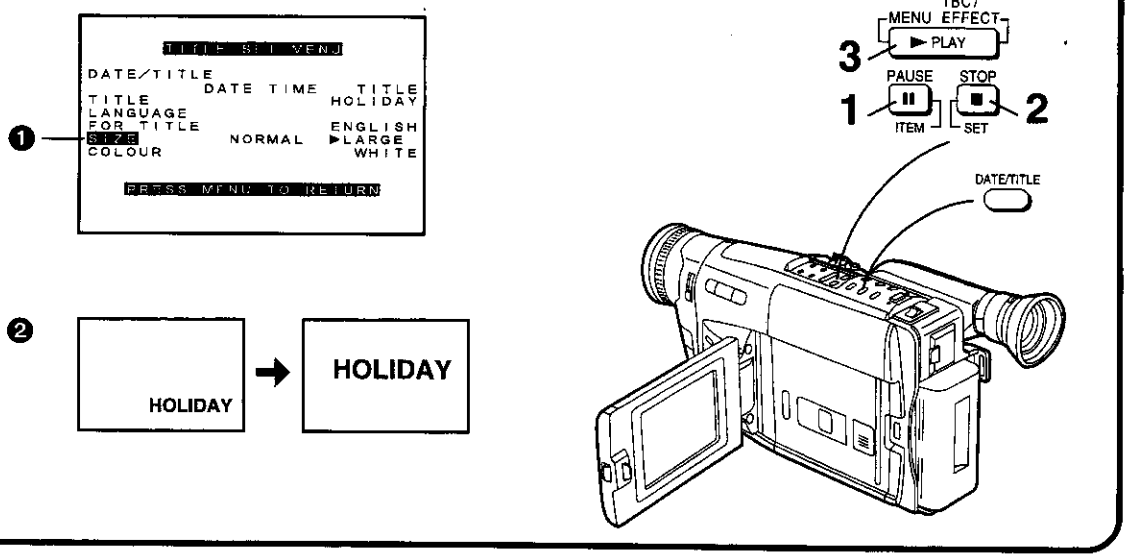
4 Press the [ITEM] Button repeatedly to select [COLOUR] ❷.

5 Press the [SET] Button to select the desired colour.

- The colours for the title change in the following order:

⟶WHITE ⟶YELLOW ⟶MAGENTA ⟶RED ⟶
BLACK⟵ BLUE⟵ GREEN⟵ CYAN⟵

6 Press the [MENU] Button twice to exit the menu.



Selecting the Size of the Pre-programmed Title

You can choose either of 2 sizes for the title.

After displaying the [TITLE SET MENU] Menu... (➔ 17)

1 Press the [ITEM] Button repeatedly to select [SIZE] ❶.

2 Press the [SET] Button to select the desired size ([NORMAL] or [LARGE]).

- When you change the title size from [NORMAL] to [LARGE], the Title Indication changes as shown above ❷.

3 Press the [MENU] Button twice to exit the menu.

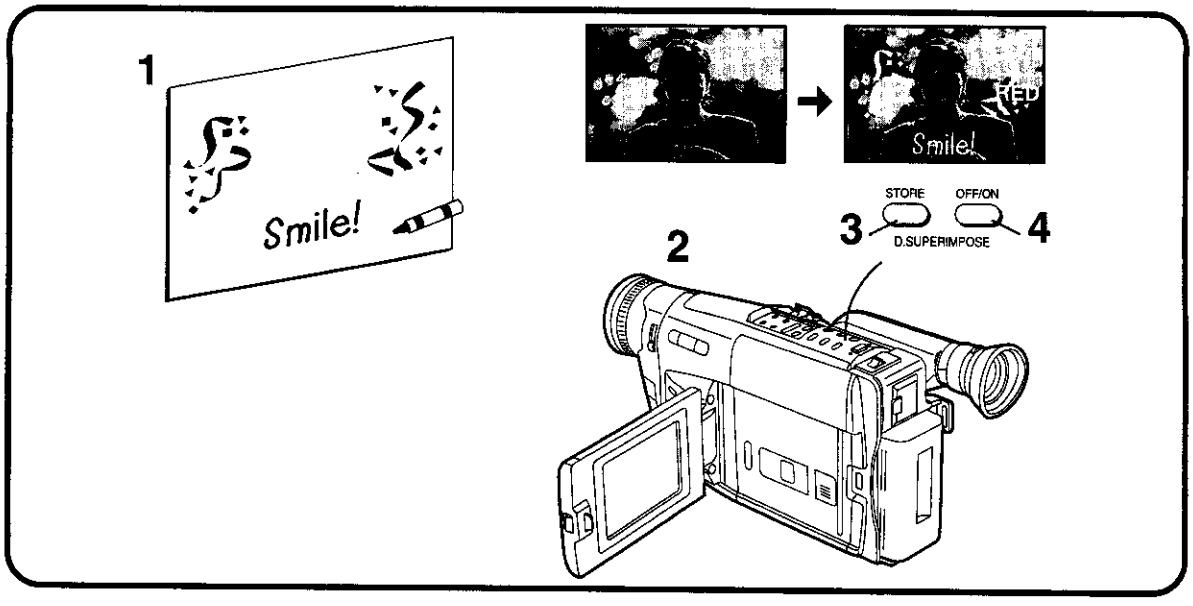
- When you have set [LANGUAGE FOR TITLE] on the [TITLE MENU] Menu to [ARABIC], [POSITION] appears instead of [SIZE] and you can select [CORNER] or [CENTER] for the position of the title.
- When a large-size title is displayed, the indications of the following modes do not appear even if the corresponding modes are activated:
  Super Image Stabilizer, Digital Zoom, Digital Effects, Manual White Balance, Manual Focus, TBC, Colour for Digital Image, 0 Lux Night View, Auto Power Save, Effect.
- If you set [SIZE] on the [TITLE SET MENU] Menu to [LARGE], the large [RECORD] and [PAUSE] Indications, which usually appear briefly when you start or stop recording, do not appear. However, if you have set [LANGUAGE FOR TITLE] on the [TITLE SET MENU] Menu to [ARABIC], the large [RECORD] and [PAUSE] Indications do not appear at all.

Recording with Pre-programmed Title Inserted in the Picture

During recording, press the [DATE/TITLE] Button to make the title appear.

Deleting the Title

Press the [DATE/TITLE] Button to make the title disappear.



Creating Your Own Titles and Inserting Them During Recording

(Digital Superimposer Function)

This function lets you store the image of a handwritten title, signboard, printed title, (or some similar object with strong contrast) in the Movie Camera's digital image memory. You can then change the dark parts of this image to a desired colour and superimpose it during recording.

Storing Your Own Title in the Digital Image Memory

1 Prepare a title that has strong contrast (e.g. write with a thick black marker or felt-tip pen on white paper).

2 With the Movie Camera in the Recording Pause Mode, aim it at the title.

- If the Full Auto Mode does not provide a sharp picture, adjust the focus manually. **(➔ 66)**
- When you want to capture a small title, use the Macro Close-up Function. **(➔ 34)**
- Aim the Movie Camera so that the title is in the centre of the screen to ensure that the title does not get clipped at the edges.

3 Press the [STORE] Button for more than 0.5 second.

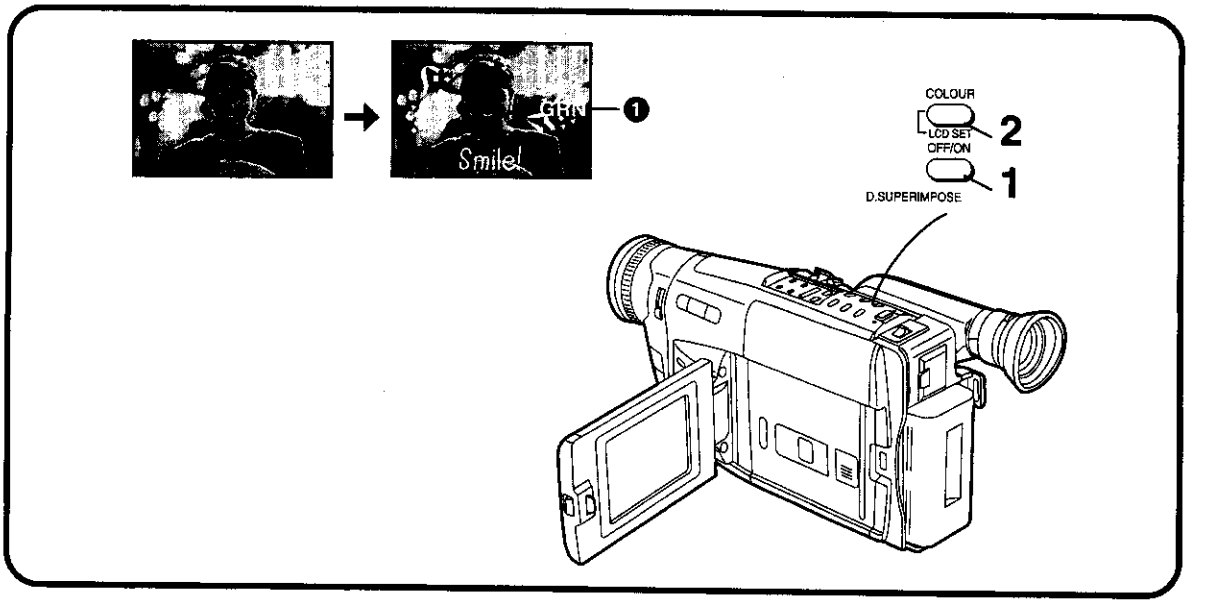
- The title is now stored in the digital image memory and it remains displayed.

4 Press the [OFF/ON] Button to make the title disappear.

- Pressing the [OFF/ON] Button repeatedly makes the title appear and disappear.

The title stored in the digital image memory is automatically cancelled when you store a new title, remove the Battery, disconnect the AC Adaptor, or when the Battery becomes discharged.

- When you are using the Digital Superimposer Function, adjusting the LCD Brightness or LCD Colour Level on the [LCD SET MENU] Menu is not possible. **(➔ 21)**



Selecting the Desired Colour of Your Own Title

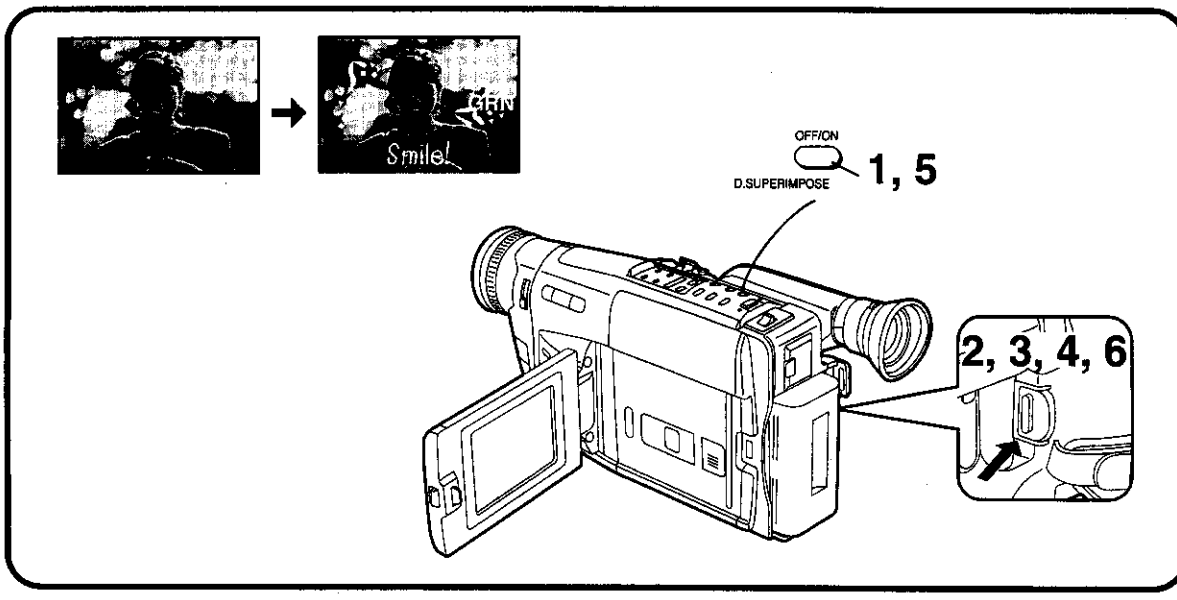
1 Press the [OFF/ON] Button to make the title appear.

2 Press the [COLOUR] Button repeatedly until the desired colour ❶ is displayed.

- The colours of the title change in the following order:

WHT (White) → YEL (Yellow) → MAG (Magenta) → RED (Red) → BLK (Black) ← BLU (Blue) ← GRN (Green) ← CYN (Cyan) ←

- When you are using the Digital Superimposer Function, the [LCD SET MENU] Menu does not appear, even if you press the [LCD SET] Button. **(→ 21)**



Inserting Your Own Title at the Beginning of a Recording

1 Press the [OFF/ON] Button to make the title appear.

- Confirm that the colour indicated is suitable for the intended scene. If necessary, change the colour (→ 78).

2 Press the Recording Start/Stop Button to start recording.

- To make the title disappear while recording of the scene continues, press the [OFF/ON] Button.

3 Press the Recording Start/Stop Button to stop recording.

Inserting Your Own Title During Recording

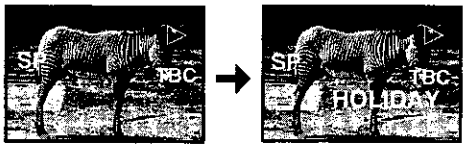
4 Press the Recording Start/Stop Button to start recording.

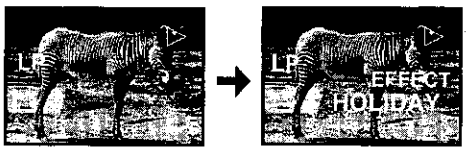
5 At the point where you want to insert the title, press the [OFF/ON] Button to make the title appear.

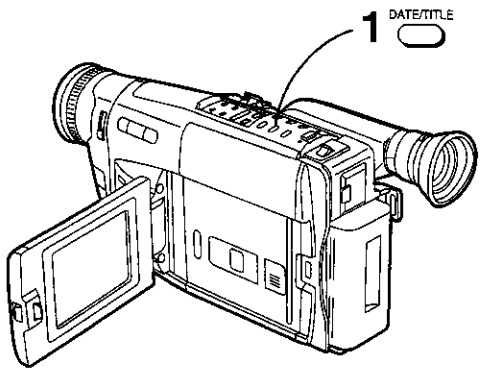
- To make the title disappear while recording of the scene continues, press the [OFF/ON] Button.

6 Press the Recording Start/Stop Button to stop recording.

- By displaying the title which you stored in the digital image memory and using the Digital Fade 1, Digital Fade 2 or Digital Fade 3 Function, you can fade the title together with the picture.
- It is not possible to apply the Negative Effect when storing a title in the digital image memory.
- After turning the Movie Camera off and then on again, the title that had been displayed in the picture is no longer displayed. To make it appear again, press the [OFF/ON] Button.







Using Various Functions during Playback

With this Movie Camera you can add various effects to the recorded picture during playback. This is especially convenient for creatively enhancing certain scenes when you edit individual recorded scenes into a finished video.

1. **Playback Title Indication**
2. **Playback Digital Fade (➔ 81)**
3. **Playback Digital Superimposer (➔ 82)**

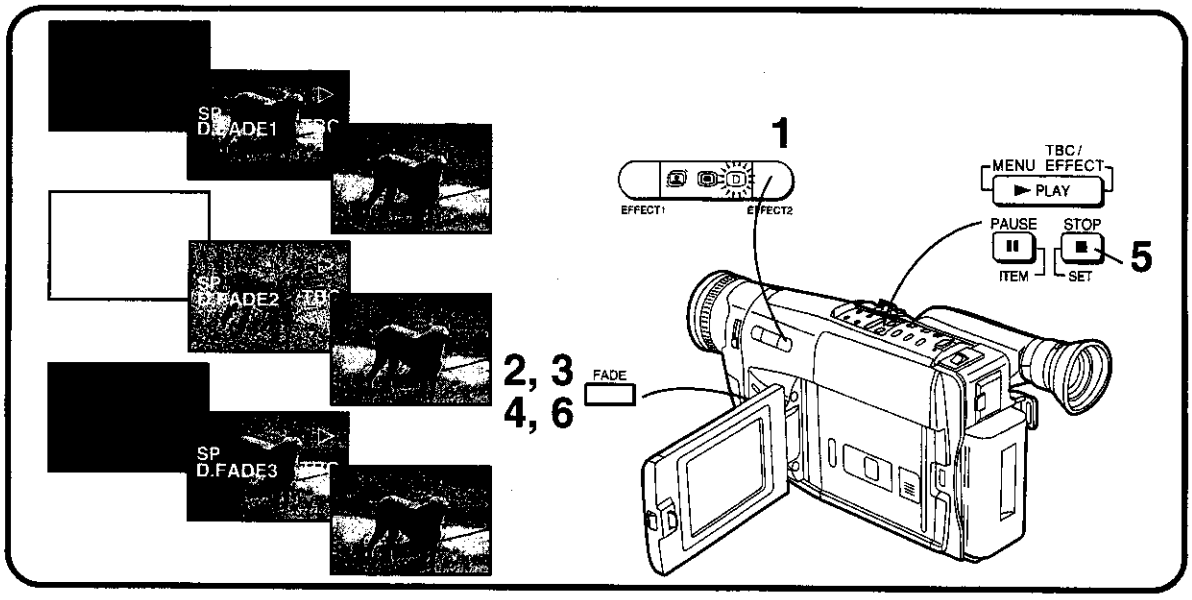
In the SP Mode, you can use these functions when the [TBC] Indication is displayed.
To use these functions in the LP Mode, first display the [EFFECT] Indication by keeping the [EFFECT] Button pressed for a few seconds.
When you display the [EFFECT] Indication and play back scenes recorded in the LP Mode, slight horizontal shaking may occur in the picture. In this case, keep the [EFFECT] Button pressed until the [EFFECT] Indication disappears. (However, the above functions cannot be used during playback.)

Playback Title Indication

The Date/Time/Title Indication that can be inserted in the pictures during recording **(➔ 74)** can also be inserted in the picture during playback (editing).
You can select the desired language, title, colour and size on the [TITLE SET MENU] Menu.
In the SP Mode, the Playback Title Indication Function can be used when the [TBC] Indication is displayed, and in the LP Mode, when the [EFFECT] Indication is displayed. Make sure that the corresponding indication is displayed.

1 During playback, press the [DATE/TITLE] Button to superimpose the desired Date/Time/Title Indication.

- To make the superimposed Date/Time/Title Indication disappear, press the [DATE/TITLE] Button again.
- The Date/Time Indication is generated by the Movie Camera's built-in clock.



Playback Digital Fade

There are 3 Playback Digital Fade Modes available. They are the same as the Digital Fade Modes that can be used for recording (➔ 58).
In the SP Mode, the Playback Digital Fade Function can be used when the [TBC] Indication is displayed, and in the LP Mode, when the [EFFECT] Indication is displayed. Make sure that the corresponding indication is displayed.

1 With the Movie Camera in the VCR Mode ([VCR] Lamp lights), press the [EFFECT2] Button repeatedly until the desired Digital Fade Indication appears.
- The Digital Effect Indication Lamp [ⓓ] lights.

■ **Fading In**

2 During playback, keep the [FADE] Button pressed.
- The picture disappears gradually with the selected digital fade effect.

3 Approximately 3–4 seconds later, release the [FADE] Button.

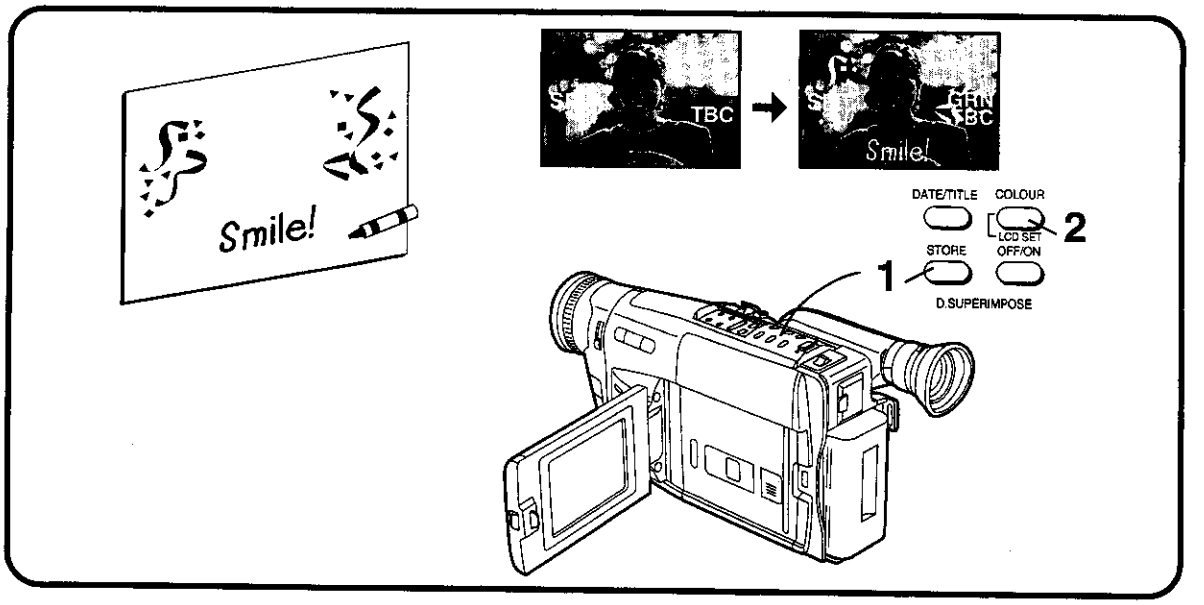
■ **Fading Out**

4 During playback, press the [FADE] Button at the point where you want to fade out, and keep it pressed.

5 After the picture has completely disappeared, press the [STOP] Button.
- Playback stops.

6 Release the [FADE] Button.

Cancelling the Selected Digital Fade Function
Press the [EFFECT2] Button repeatedly until none of the Digital Fade Indications are displayed any more. Or, press the [EFFECT2] Button for more than 2 seconds so that none of the Digital Fade Indications are displayed any more.



Playback Digital Superimposer

This function gives the pictures the same visual effect as the Digital Superimposer Function (➜ 77).
In the SP Mode, the Playback Digital Superimposer Function can be used when the [TBC] Indication is displayed, and in the LP Mode, when the [EFFECT] Indication is displayed. Make sure that the corresponding indication is displayed.

■ Storing Your Own Title in the Digital Image Memory

1 During playback or in the Playback Stop Mode, when you reach the scene that you want to superimpose as a title in another scene, press the [STORE] Button for more than half a second.

- The title captured in the digital image memory remains on the screen.
- To stop the superimposing of the title press the [OFF/ON] Button. The title disappears.

■ Selecting the Desired Colour for the Title

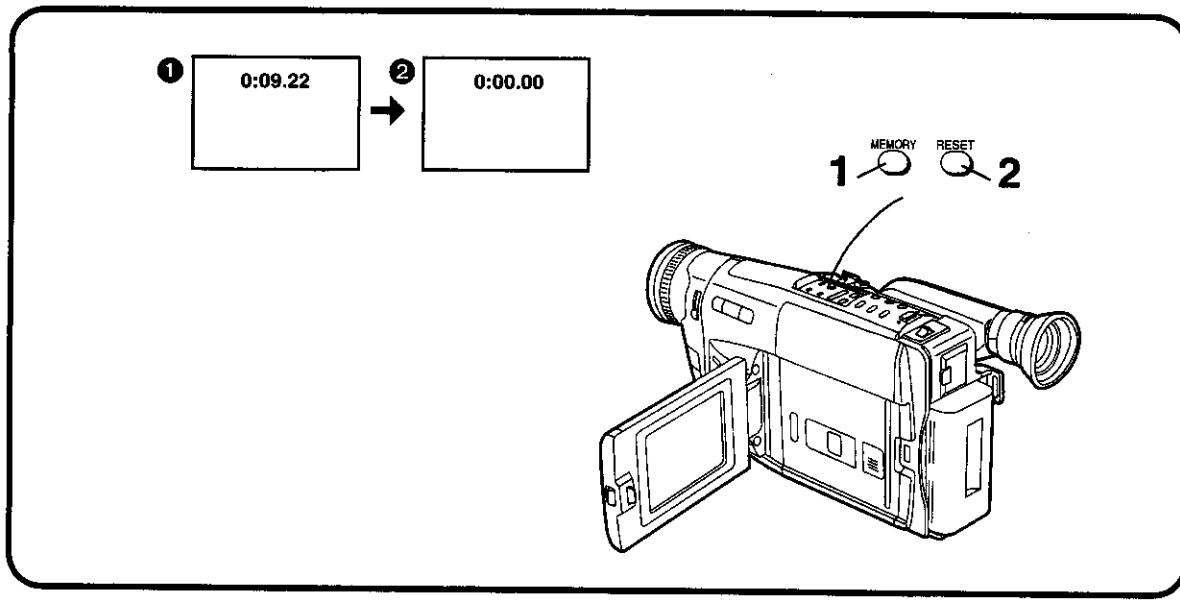
2 While the title is displayed, press the [COLOUR] Button repeatedly until the desired colour appears.

- The colours for the title change in the following order:

WHT (White) → YEL (Yellow) → MAG (Magenta) → RED (Red) → BLK (Black) ← BLU (Blue) ← GRN (Green) ← CYN (Cyan) ←

Cancelling the Playback Digital Superimposer Function

Press the [OFF/ON] Button to make the title disappear.



Using the Tape Counter Indication

The Tape Counter Indication is convenient for the following two purposes: to check the Elapsed Tape Time (described below), and to use the Memory Stop Function (➔ 85).

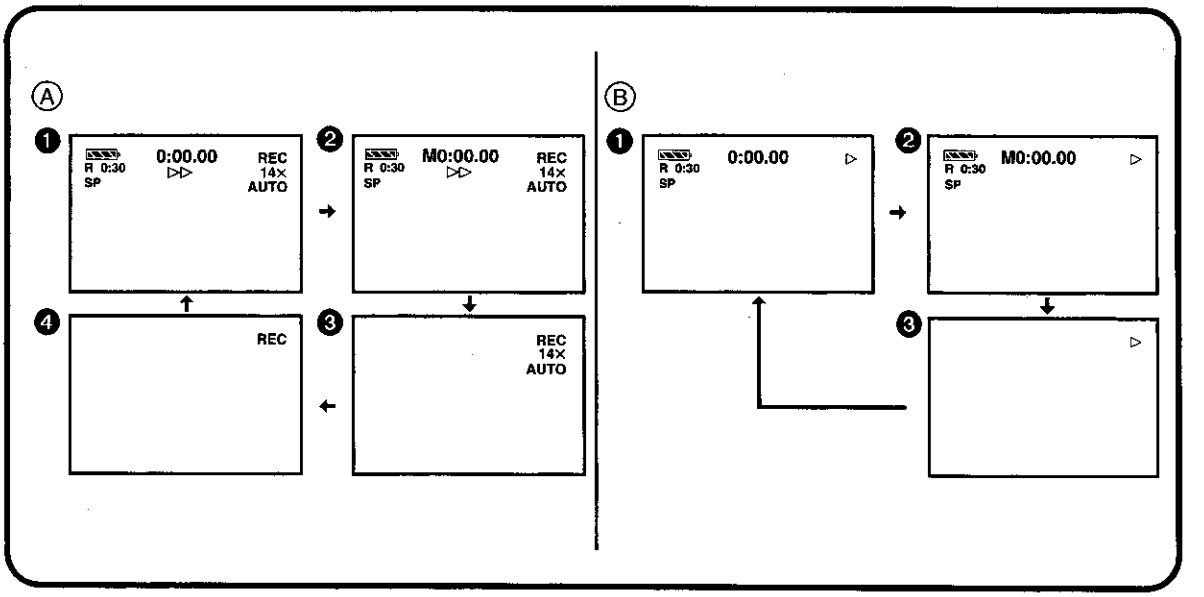
Checking the Elapsed Tape Time

The Elapsed Tape Time Indication shows the amount of time that has elapsed during recording or playback.

1 Press the [MEMORY] Button repeatedly until the Elapsed Tape Time Indication ❶ is displayed.

2 Press the [RESET] Button before starting to record or play back to reset the Elapsed Tape Time Indication to [0:00.00] ❷.

- When recording or playback starts, the elapsed tape time is indicated in hours, minutes and seconds. During playback of parts of the tape on which no recording has been made, this indication does not change.
- If you rewind the tape further than the tape counter position [0:00.00], the minus sign [–] appears in front of the Tape Counter Indication.
- Taking out the cassette or removing the Battery automatically resets the indication to [0:00.00].



■ Changing the Tape Counter Indication

Every press of the [MEMORY] Button changes the Tape Counter Indication in the following order:

During Recording, Recording Pause and in the Playback Stop Mode Ⓐ

❶ Elapsed Tape Time Indication (initial setting)

❷ Memory Stop Indication and Elapsed Tape Time Indication **(➔ 85)**

❸ No Counter Indication (In this mode, the Remaining Battery Operation Time Indication, Remaining Tape Time Indication, Digital Effect Indications, etc. do not appear. However, when you turn on the Movie Camera, all indications initially appear for a few seconds to inform you of the selected settings.)

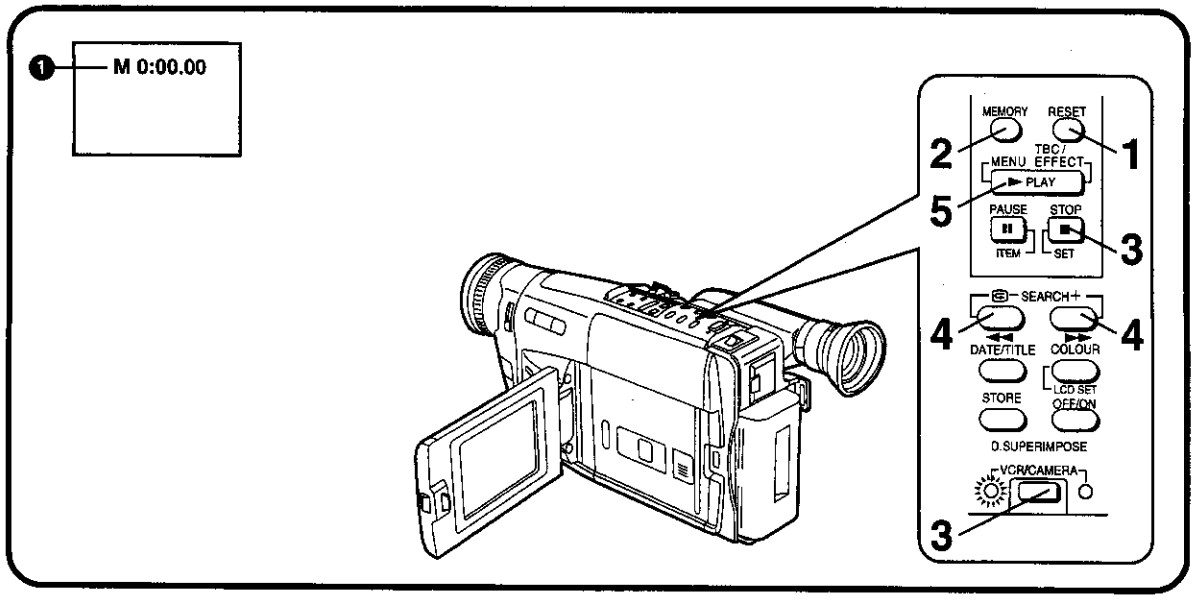
❹ No Counter Indication (In this mode, only the Operation Mode Indications and Warning/Alarm Indications can appear. However, when turning on the Movie Camera, all indications appear for a few seconds to inform you of the selected settings.)

During Playback Ⓑ

❶ Elapsed Tape Time Indication (initial setting)

❷ Memory Stop Indication and Elapsed Tape Time Indication **(➔ 85)**

❸ No Counter Indication (In this mode, only the Operation Mode Indications and Warning/Alarm Indications can appear.)



Using the Memory Stop Function

This function is convenient for temporarily marking a tape position during recording or playback so that you can easily find it again later for playback.

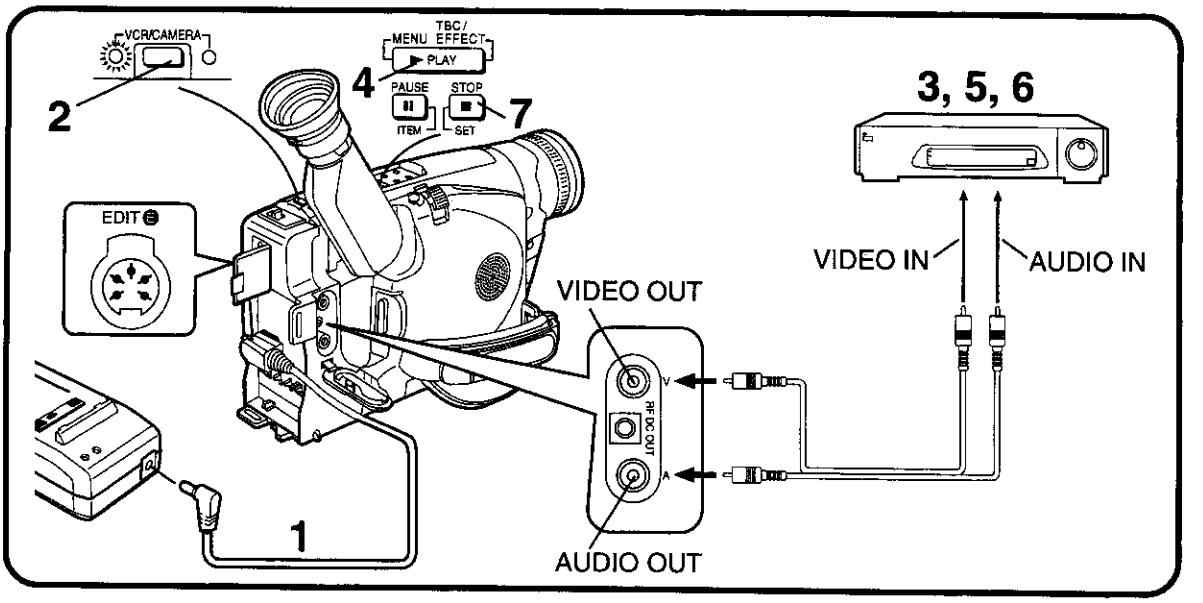
1 **Press the [RESET] Button during recording or playback at the desired tape position to reset the Elapsed Tape Time Indication to [0:00.00].**

2 **Press the [MEMORY] Button so that the Memory Stop Indication [M] ❶ appears in front of the Elapsed Tape Time Indication.**
- [M] means Memory.

3 **During playback:**
Press the [STOP] Button to stop playback.
During recording:
Press the Recording Start/Stop Button to switch the Movie Camera over to the Recording Pause Mode. Then, press the [VCR/CAMERA] Button to switch the Movie Camera over to the VCR Mode (the [VCR] Lamp lights.)

4 **Press the [▶▶] or [◀◀] Button.**
- The tape automatically stops approximately at the [M0:00.00] position.

5 **Press the [PLAY] Button to start playback.**



Dubbing (Copying)

By connecting the AV Cable (supplied), you can copy the cassette recorded with this Movie Camera onto a VCR.

1 Connect the AC Adaptor.

2 Insert the recorded cassette into the Movie Camera and put it in the VCR Mode.

3 Insert an unrecorded cassette into the VCR and put it in the Recording Pause Mode.

4 Start playback on the Movie Camera.

5 Start recording on the VCR.

After reaching the end of the original recording:

6 Stop recording on the VCR.

7 Stop playback on the Movie Camera.

- As the picture quality on the dubbed cassette is slightly reduced, we recommend that you select the standard speed (SP Mode) on the VCR for dubbing. (SP means Standard Play.)
- If your VCR is equipped with an Edit Switch, turn it on to ensure optimum picture quality of the dubbed cassette.

Edit Socket [EDIT ⊜]

If you connect an Editing Controller (optional) to this socket as well as to a VCR equipped with an Edit Socket, you can edit quickly and precisely.

Precautions

Precautions for the Movie Camera

In the event of abnormal operation (e.g. if the unit emits smoke or an unusual smell), immediately stop operating the unit and consult the Panasonic Customer Care Centre on 132 600.

■ To prevent fire, electric shock and malfunction, observe the following points:

- Do not disassemble the Movie Camera or make any alterations to it.
- Protect against spray water and sand.
- Take care that water splashes (especially seawater) or dust do not enter the Movie Camera. If seawater has accidentally splashed onto the Movie Camera, moisten a soft cloth with tap water, wring it out well and carefully wipe the camera body with it. Then thoroughly wipe it with a soft, dry cloth.
- Do not insert any foreign objects.
- Do not cover with a cloth during use.
- Do not subject to strong vibrations or mechanical shocks.
- Do not use in places with oily smoke and a lot of dust.
- If a thunderstorm approaches, stop using the Movie Camera. (If you are using the AC Adaptor, disconnect it from the AC mains socket taking care not to touch any metal parts.)
- Do not use near magnetized equipment.
- Do not use near a radio or TV.
- Do not use with the cassette compartment facing down.
- Do not aim the Lens or Finder directly at the sun; the lens collects light and the resulting heat could deform internal precision parts and cause irreparable damage to the Movie Camera.
- Do not leave in a closed car on a summer day.
  The inside temperature becomes higher than you imagine and this could damage the Movie Camera.
- Do not wash with water.
  Water might leak into the Movie Camera and cause an electric shock or fire.
- Do not use a cleaning fluid, benzine, thinner or other chemicals for cleaning. They might not only change the colour and damage the surface of the camera body, but might also increase the risk of fire if there is an open flame or heater nearby.

■ Precautions for Storing the Movie Camera

Be sure to take out the cassette and remove the Battery before storing.

Avoid the following places:

- Places with high temperature and high relative humidity
  Recommended temperature: 15°C–25°C
  Recommended relative humidity: 40%–60%
- Places exposed to direct sunlight
- In direct contact with rubber or plastic products for a long time
- In reach of children

Precautions for the AC Adaptor

■ Observe the following points:

- Use only for the specified Movie Camera and Battery.
- Do not handle with wet hands.
  To unplug the Mains Cable, be sure to pull it out by the plug, not by the cable.
- Do not forcefully bend the cables or alter them.
- Do not operate very close to a radio, TV etc.

Precautions for the Battery

The Battery's ability to generate electric energy is based on a chemical reaction. If the Battery is incorrectly handled, it could cause leakage, excessive rise in temperature, fire or explosion.

■ Observe the Following Points:

- Use only the specified AC Adaptor or Car Battery Charger to charge the Battery, and use the Battery only for this Movie Camera.
- When you have finished using the Movie Camera, be sure to remove the Battery.
  If you leave the Battery attached to the Movie Camera, a small amount of electricity is consumed even if the [POWER] Switch is turned in, and this reduces the Battery's charge. Leaving the Battery attached to the Movie Camera for a very long time could discharge it excessively and this could make charging impossible.
- Do not allow metal objects such as keys and necklaces to touch the battery terminals.
  Short-circuiting may occur and generate heat, and this could cause the Battery to explode. Be especially careful when storing or carrying the Battery in a bag.
- Do not deform or alter the Battery.
- When the operation time even after proper charging is too short for normal use, the service life of the Battery has reached its end.
- If the Battery becomes too warm, a protection function is activated and it puts the Battery temporarily out of operation.
- Do not throw the Battery into a fire.
  This could cause it to explode.

■ Precautions for Storing the Battery

Avoid the following places, as they could shorten the service life of the Battery:

- Places with extremely high temperature and high relative humidity
  Recommended temperature: 15°C–25°C
  Recommended relative humidity: 40%–60%
- Places with oily smoke and a lot of dust
  The terminals of the Battery might rust.
- Before you store the Battery for a long time, perform playback or other operations to completely use up the remaining charge in the Battery. Then remove it from the Movie Camera and store it. We recommend that you reactivate the Battery about once a year by charging it and then completely using up the charge before storing it again.

Precautions for the Cassette

When you have finished using the Movie Camera, rewind the tape to the beginning and take the cassette out of the Movie Camera. If you store the cassette for a long time, fast-forward and then rewind it at least once a year to expose the tape to fresh air.

Observe the following points to prevent deformation of the cassette case and deterioration of the picture and sound quality.

- Do not subject the cassette to strong vibration or mechanical shocks.
- Do not place it near magnetized equipment.
- Avoid places where the temperature can become very high.

Causes of Condensation and Remedy

When condensation has formed inside the Movie Camera and on the tape, recording becomes impossible. In addition, the tape might remain in contact with the heads and this could seriously damage the Movie Camera.

■ Main Causes of Condensation

- When the Movie Camera is brought from a cold to a warm place.
- When the Movie Camera is taken outdoors from inside an air-conditioned car or house.
- When the heating is turned on in a cold room.
- When the Movie Camera is exposed to the cold breeze from an air-conditioner.
- When the Movie Camera is in a very hot or humid place or in a place with steam.

■ Symptoms of Condensation

When turning on the Movie Camera, the Condensation Indication [U10/⛲] appears.
(A few seconds later, the Movie Camera automatically turns itself off.)

■ Remedy as Follows:

1. Take out the cassette.
2. Keep the Cassette Compartment open and wait a few hours.
3. A few hours later, turn on the Movie Camera and confirm that the Condensation Indication is not displayed any more. For added safety, wait about 1 more hour.

■ To Prevent Condensation from Forming

When bringing the Movie Camera from a very cold to a warm place, keep it in a tightly closed plastic bag or something similar for 1 to 2 hours before using it again.

■ When the Lens Is Fogged up

Turn the Movie Camera on and wait for about 1 hour until it has reached about the same temperature as its surroundings.

Video Head Clogging and Remedy

If the video heads become dirty and clogged with dust, the picture quality deteriorates.

■ Symptoms of Dirty Video Heads

- When turning on the Movie Camera, the [U11/⊗] Indication appears for the first few seconds.
- When playing back a cassette on the Movie Camera and watching the picture on a connected TV, white noise bars appear in the picture. However, if the heads are extremely dirty, the playback picture cannot be seen at all.

■ Remedy as Follows:

Use a video head cleaning cassette to clean the heads. Carefully follow the instructions for its use as too much cleaning wears down the heads. The removal of head cleaning tape is not covered by warranty. If the playback picture is not clear after cleaning, it means that the video heads are worn out. Consult the Panasonic Customer Care Centre on 132600.

How the White Balance (Tint) *Adjustment Works*

Video recording takes place under various light sources, from sunlight as the main natural light source to a wide range of artificial light sources such as fluorescent lamps. As each of these light sources has a different colour temperature, each of them gives the colours of the subject a slightly different tint.
Human eyes can easily adjust to different kinds of lighting and recognize an object as having the same colour, even under different light sources.
The eye of the Movie Camera (lens), however, cannot adapt to the change in lighting and is influenced by the lighting. Therefore, depending on the light source, the picture would be recorded with a bluish or reddish tint.
To minimize the influence of the lighting on the colours of the subject, an adjustment called White Balance Adjustment is necessary.

■ Auto White Balance

This Movie Camera offers both Auto White Balance Adjustment and Manual White Balance Adjustment.
When the Movie Camera is in the Full Auto Mode, the internal system of the Movie Camera automatically determines the temperature of the light and compensates the tint of the subject accordingly. White is the basic colour by which the tint is determined.
Because this adjustment is performed based on the white colour, it is called White Balance Adjustment. The optimum settings for several light sources are stored in the memory of the Movie Camera. The internal microcomputer compares the colour temperature of the light received by the White Balance Sensor positioned on the front of the Movie Camera with the colour stored in memory, and selects the setting for the most similar tint.
Be careful not to cover the White Balance Sensor **(➔ 7)** with your hand, etc.

■ Manual White Balance

Although this Movie Camera stores the optimum settings for several light sources in memory to correctly judge the white colour, it cannot cope with all light sources. Therefore, to record under those types of lighting **(➔ 63, 65)** which cannot be correctly adjusted with the Auto White Balance Adjustment, use the Manual White Balance Adjustment. **(➔ 64)**

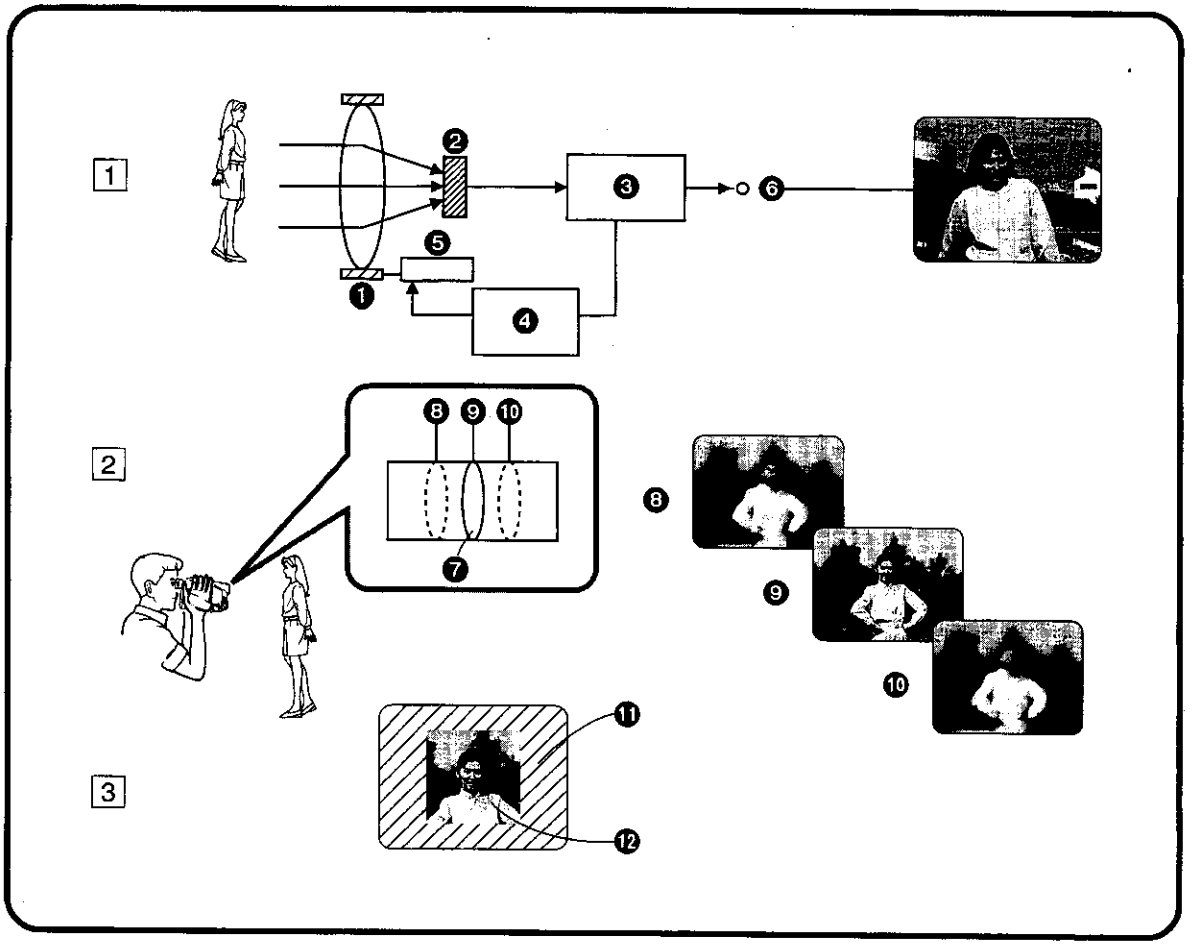
How the Focus Adjustment Works

If you look at an object through a magnifying glass and move it closer or further away from your eye, you will reach a point where the object becomes clearly visible. Being focused or in focus means that the subject can be seen with optimum clarity and sharpness. The distance between the lens and the point where the rays of light come together is called Focal Distance or Focal Length and depends on the size and shape of the lens. Human eyes have lenses too, and when we look at objects at different distances, the shape of these lenses changes automatically so that we can always see the objects clearly.

■ Auto Focus Adjustment

The image of the subject enters the Movie Camera through the lens and is converted into an electrical signal (video signal) for recording onto tape. Based on this signal, the Auto Focus System automatically adjusts the focal distance by moving the focusing lens forward or backward.

The focus is adjusted on the subject in the centre of the Finder.

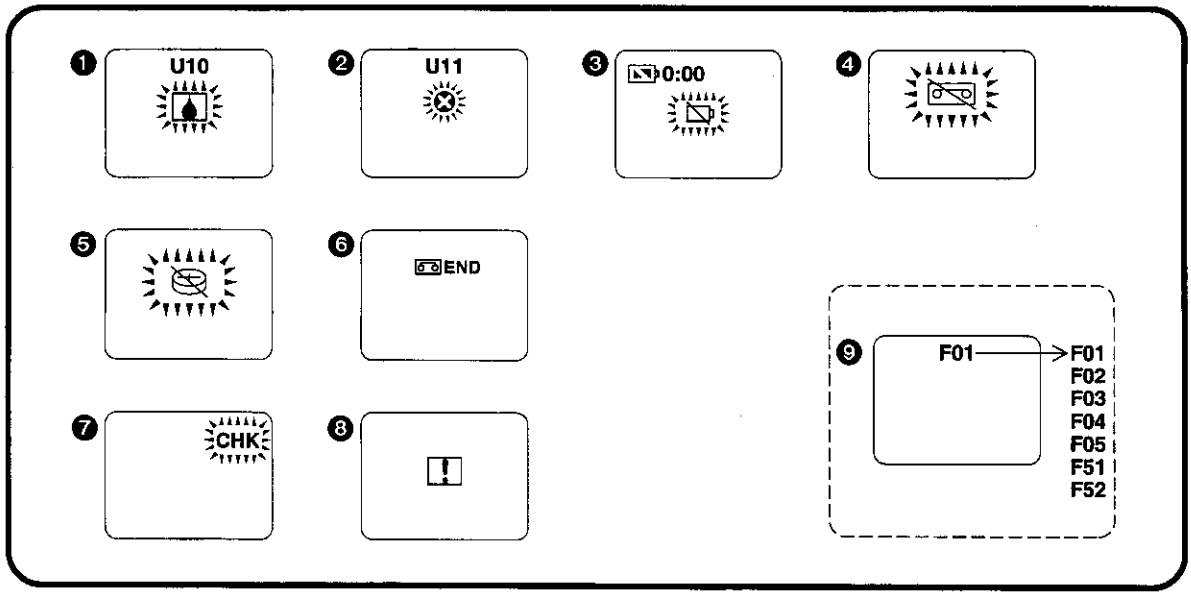


■ Functional Diagram of the Auto Focus Function

❶ Focusing Lens
❷ CCD Image Sensor
❸ Signal Processing
❹ Microprocessor
❺ Focusing Lens Motor
❻ Picture Signal for Recording
❼ Focusing Lens
⓫ Finder Screen
⓬ Image area on which the Auto Focus Function adjusts the focus

When you aim the Movie Camera at the subject that you want to record, the microprocessor determines (based on the information about the vertical contours in the picture signal received by the CCD Image Sensor) whether the subject in the middle of the picture is properly focused. If not optimally focused, it quickly moves the focusing lens in tiny steps from the previous focus setting ❽ or ❿ until the vertical contours of the subject become sharpest ❾.

- As this Movie Camera automatically adjusts the focus based on the information on the subject's vertical contours, precise focusing is not possible for subjects with weak vertical contours (→ 63).
- Unlike the human eye, the Movie Camera's Auto Focus System cannot change the focus from a distant to a close subject instantaneously.



Indications

■ Warning/Alarm Indications

❶ Condensation (➜ 89)

❷ Video Head Clogging (➜ 89)

❸ Remaining Battery Power

When the remaining battery power is used up, the Movie Camera automatically switches off. Replace the Battery with a fully charged one.

❹ Cassette

No cassette is inserted. Or the tab of the inserted cassette is broken out. Insert a cassette with an intact tab.

❺ Built-in Lithium Battery (➜ 29)

The built-in Lithium Battery is exhausted. Charge it.

❻ End of the Tape

When the tape has reached its end, this indication appears. Insert a new cassette.

❼ Anti-Ground Recording (➜ 44)

❽ General Warning/Alarm Indication

If you have selected the Mirror Mode (➜ 73) on the [MAIN MENU2] Menu and record with the LCD Monitor facing forward, this indication appears instead of the actual Warning/ Alarm Indication and Error Code.

❾ Error Code

(Error codes are information for service personnel.)

If the [F] Indication with a 2-digit number appears, a malfunction has occurred.

If the indicated error code is between [F01] and [F05], the Movie Camera will turn off automatically one minute after the [CAMERA] Lamp has started to flash.

If the indication is [F51] or [F52], the Movie Camera will not turn off automatically.

F01:Locked Take Up-Reel

F02:Locked Supply-Reel

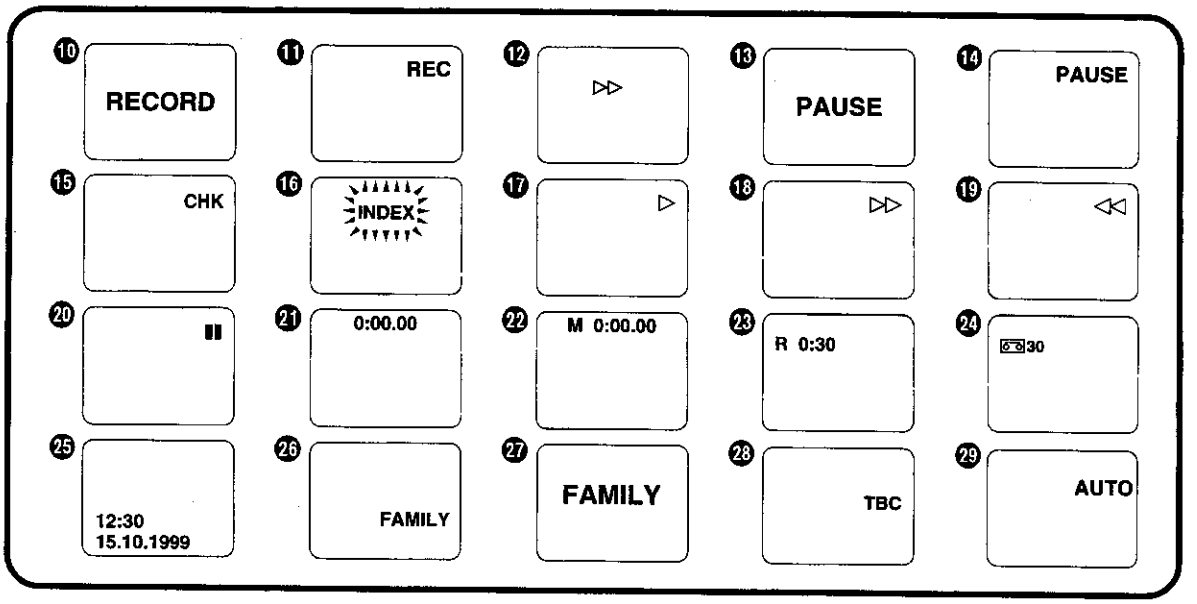
F03:Locked Unloading Mechanism

F04:Locked Loading Mechanism

F05:Locked Cylinder

F51:Locked Focus Motor

F52:Locked Zoom Motor



■ Recording and Playback Indications

⑩ Recording Mode (large indication) (➔ 30)

⑪ Recording Mode (small indication) (➔ 30)

⑫ Tape Movement during Recording (➔ 30)

⑬ Recording Pause Mode (large indication) (➔ 30)

⑭ Recording Pause Mode (small indication) (➔ 30)

⑮ Recording Check Mode (➔ 32)

⑯ Index Signal Recording Mode

An index signal is automatically recorded (and the [INDEX] Indication flashes briefly while it is being recorded) when you:

- Start recording after connecting the AC Adaptor or attaching the Battery.
- Start recording after inserting a cassette.
- Start recording after pressing the [VCR/CAMERA] Button to change from the VCR to the Camera Mode.

The recording of index signals makes it possible to use the VHS Index Search or Intro Scan Function during playback on a VCR equipped with these functions.
(Refer to the operating instructions of your VCR.)

⑰ Playback Mode (➔ 35)
Camera Search Mode (➔ 32)

⑱ Fast Forward/Cue Mode (➔ 40, 41)

⑲ Rewind/Review Mode (➔ 40, 41)
Camera Search Mode (➔ 32)

⑳ Still Playback Mode (➔ 41)

㉑ Elapsed Tape Time (➔ 83)

When the tape is rewound further than the position [0:00.00], the minus sign [–] appears in front of the Elapsed Tape Time Indication.

㉒ Elapsed Tape Time with activated Memory Stop Function (➔ 85)

㉓ Remaining Tape Time (➔ 24)

㉔ Tape Length (➔ 23)

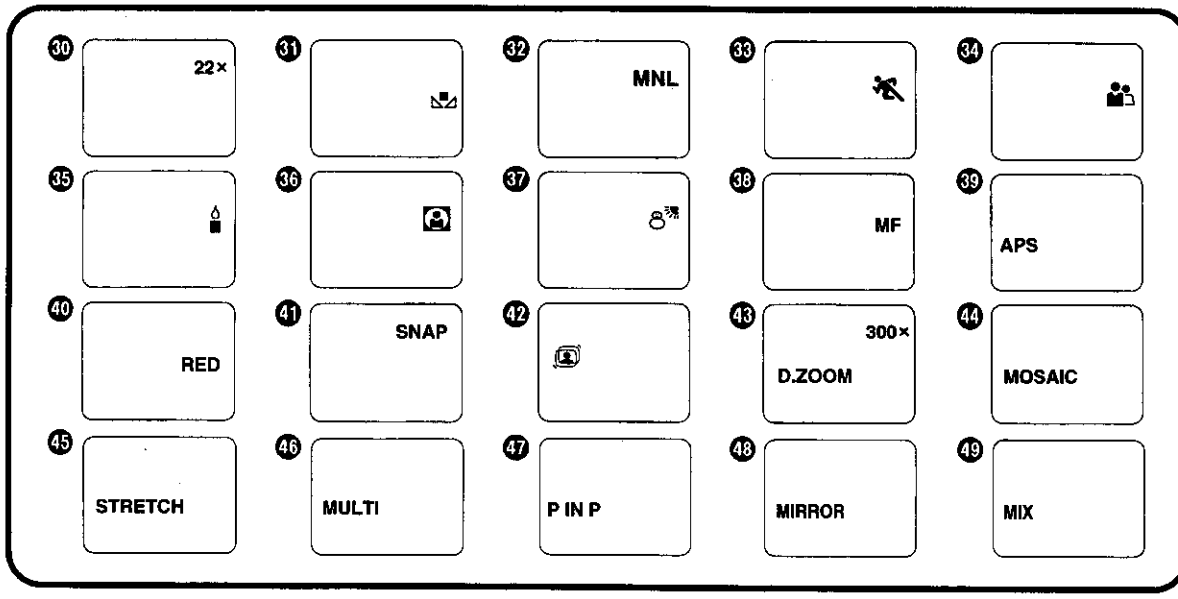
㉕ Date and Time (➔ 27)

㉖ Title (small indication) (➔ 76)

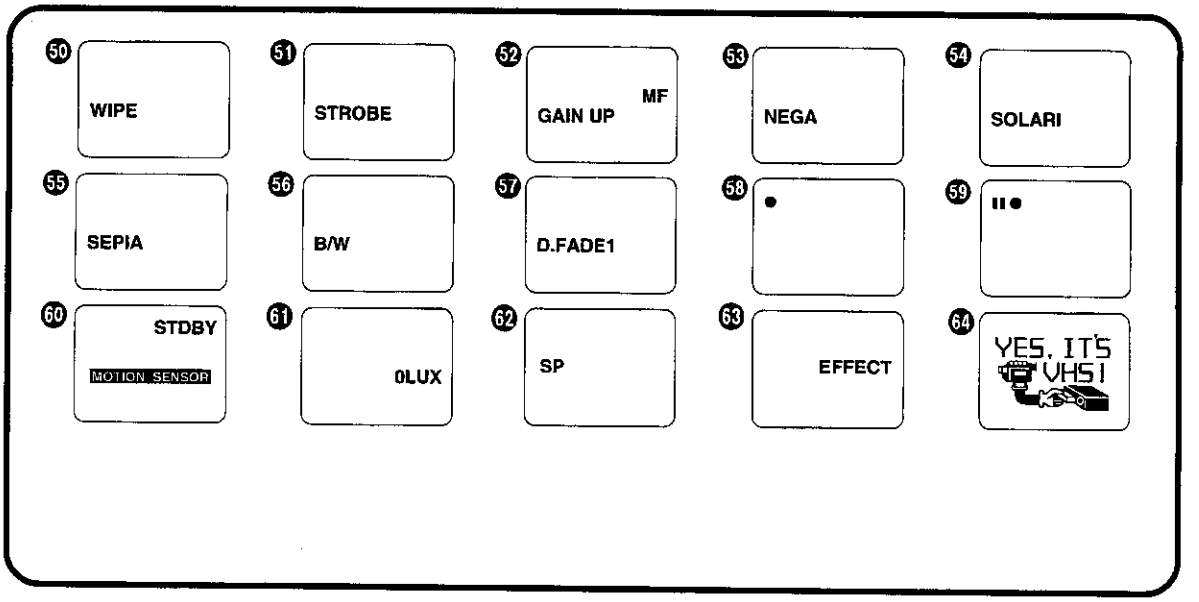
㉗ Title (large indication) (➔ 76)

㉘ Time Base Corrector (➔ 36)

㉙ Full Auto Mode (➔ 30)



㉚ Zoom Magnification (➔ 33)
㉛ Manual White Balance Mode (➔ 64)
㉜ Manual Recording Mode (➔ 64, 66)
㉝ Sports Mode (➔ 67)
㉞ Portrait Mode (➔ 67)
㉟ Low Light Mode (➔ 67)
㊱ Spotlight Mode (➔ 67)
㊲ Surf & Snow Mode (➔ 67)
㊳ Manual Focus Mode (➔ 66)
㊴ Power Save Mode (➔ 43)
㊵ Colour Indication for Digital Image (➔ 78)
㊶ Snapshot Recording Mode (➔ 46)
㊷ Super Image Stabilizer Mode (➔ 51)
㊸ Digital Zoom Mode (➔ 52)
㊹ Mosaic Mode (➔ 48)
㊺ Stretch Mode (➔ 48)
㊻ Multi Image Mode (➔ 53, 54)
㊼ Picture-in-Picture Mode (➔ 55)
㊽ Mirror Mode (➔ 48)
㊾ Mix Mode (➔ 56)



50 Wipe Mode (→ 57)
51 Strobe Mode (→ 49)
52 Gain up Mode (→ 49)
53 Nega Mode (→ 50)
54 Solarisation Mode (→ 50)
55 Sepia Mode (→ 50)
56 Black-and-White Mode (→ 50)
57 Digital Fade Mode (→ 58)
58 Recording Mode (→ 73)
59 Recording Pause Mode (→ 73)
- The above indications 58 and 59 are only displayed when recording in the Mirror Mode.

60 Motion-Sensor-Controlled Recording Function Stand-by Mode (→ 59)
61 0 Lux Night View Mode (→ 61)
62 Recording Speed Mode (→ 30)
63 Effect Mode (→ 80)
64 Demonstration Mode

Demonstration Mode

If you connect the AC Adaptor to the Movie Camera, turn the Movie Camera on without any cassette inserted, and leave it on for approximately 10 minutes without performing any operation, it automatically switches over to the Demonstration Mode. The Movie Camera remains in this mode until you turn it off and disconnect the AC Adaptor.

Cancelling the Demonstration Mode

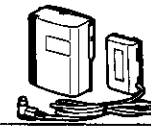
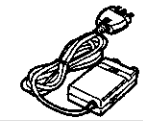
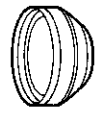
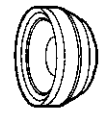
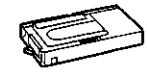
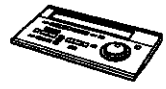
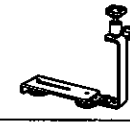
Set [DEMO MODE] on the [MAIN MENU2] Menu to [OFF].

Or, turn in the [POWER] Switch to turn the Movie Camera off, then turn it out again while pressing the [STOP] Button. (This cancels the Demonstration Mode even if [DEMO MODE] on the [MAIN MENU2] Menu is still set to [ON].)

Reactivating the Demonstration Mode

Set [DEMO MODE] on the [MAIN MENU2] Menu to [ON].

Or, turn out the [POWER] Switch while pressing the [PLAY] Button. (This reactivates the Demonstration Mode even if [DEMO MODE] on the [MAIN MENU2] Menu is still set to [OFF].)

1. VW-AS7A	2. CGR-V610	3. CGR-V620	4. CGR-V816 	5. VW-KBC7E	6. VW-RF7E 
7. VW-K10E	8. VW-LF43WE	9. VW-LT4314WE 	10.VW-LW4307WE 	11.VZ-CT55E	12.VW-TCA7E 
13.VW-VT1A	14.VW-EC1E	15.VW-EC500E 	16.VZ-LDR10E	17.VW-SK11E 	

Optional Accessories

1. AC Adaptor
2. Battery Pack (Lithium-Ion)
3. Battery Pack (Lithium-Ion)
4. Battery Pack (Lithium-Ion)
5. Car Battery Charger
6. RF Adaptor
7. 5-Pin Synchro Edit Cord
8. Filter Kit
9. Tele Conversion Lens
10. Wide Conversion Lens
11. Tripod
12. Cassette Adaptor
13. Video Titler
14. Editing Controller
15. Editing Controller
16. IR/Video DC Light (Halogen & Infra-red)
    (It requires the Shoe Adaptor for attaching to the Movie Camera.)
17. Shoe Adaptor (for attaching the IR/Video DC Light)

Some accessories are not available in some countries.

Specifications

VHS-C Movie Camera

Information for your safety

Power Source:	7.2 V (Battery) 7.9 V (AC Adaptor)
Power Consumption: **(Battery Operation)**	5.1 W (When using Finder) 6.1 W (When using LCD Monitor)
Tape Format:	VHS-C Cassette
Recording/Playback Time:	LP: 2 hours with EC60
VIDEO	
Television System:	CCIR; 625 lines, 50 fields PAL colour signal
Output Level:	VIDEO OUT (PHONO); 1.0 Vp-p, 75 ohm terminated
AUDIO	
Output Level/ Impedance:	AUDIO OUT (PHONO); −6 dBV (47 kohm loaded)/ less than 1 kohm
Input Sensitivity/ Impedance:	MIC IN (M3) −70 dBV, 4.7 kohm or more, unbalanced
Audio Track:	1 track (Normal – Monaural)
Image Sensor:	1/4-inch CCD Image Sensor
Lens:	22:1 Power Zoom Lens (Optical capability) F1.6 Focal Length; 3.7–81.4 mm Digital AF Auto Focus/Auto Iris Filter Diameter; 43 mm
Monitor:	**(NV-VX37A)** 2.5-inch Colour LCD Monitor **(NV-VX57A)** 3-inch Colour LCD Monitor
Finder:	0.5-inch Electronic Finder
Standard Illumination:	1,400 lx
Minimum Required Illumination:	0.7 lx (Low Light Mode) (0.4 lx: Minimum Required Illumination for visible image)
Operating Temperature:	0°C–40°C
Operating Humidity:	10%–80%
Weight:	**(NV-VX37A)** Approx. 860 g (without Battery) **(NV-VX57A)** Approx. 870 g (without Battery)
Dimensions:	Approx. 102 (W)×127 (H)× 263 (D) mm

AC Adaptor

Information for your safety

Power Source:	AC 100–240 V, 50/60 Hz
Power Consumption:	27 W
DC Output:	DC 7.9 V, 8.5 W (Movie Camera Operation) DC 8.4 V, 1.4 A (Battery Charging)
Weight:	Approx. 235 g (without AC Mains Cable)
Dimensions:	Approx. 72 (W)×49 (H)× 143 (D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Before Requesting Service

(Problems & Solutions)

Power Supply

P1: The Movie Camera does not turn on.

S1: Is the Battery or the AC Adaptor connected correctly? Confirm the connection. **(➔ 10, 13)**

P2: The Movie Camera has turned off automatically.

S2: If you leave the Movie Camera in the Recording Pause Mode for more than 6 minutes, it automatically switches off to protect the tape and to conserve battery power. Turn in the [POWER] Switch to switch the Movie Camera off, and then turn it out again to switch the Movie Camera on. **(➔ 31)**

P3: The Movie Camera quickly turns off.

S3-1: Is the Battery discharged? When the Remaining Battery Operation Time Indication shows "0:00" or the [⌧] Indication is flashing, the Battery is discharged. Charge the Battery or attach a fully charged Battery. **(➔ 11, 13)**

S3-2: Has condensation formed? If the Movie Camera is brought from a cold to a warm place, condensation may form inside. In this case, the Movie Camera automatically switches off and no operations can be performed except taking out the cassette. Wait until the Condensation Indication disappears (approximately 2 - 3 hours). **(➔ 89)**

Cassette

P1: The Remaining Tape Time Indication is not correct.

S1: Is the tape length of the inserted cassette correctly selected? Select the correct tape length. **(➔ 23)**

P2: The Movie Camera and cassettes underwent security X-ray inspection at an airport. Does this affect the cassettes?

S2: No, this has no negative influence on the Movie Camera or the cassettes.

P3: When playing back a cassette that was stored for some time, the picture is distorted.

S3: The cassette was stored in an unsuitable place (dusty, humid, hot, etc.) or near strongly magnetized objects or equipment. Unfortunately, there is no remedy. Always store the cassettes correctly. **(➔ 88)**

Recording

P1: No picture appears in Finder.

S1: LCD Monitor is open (Except when recording with LCD Monitor facing forward). Securely close LCD Monitor. **(➔ 15)**

P2: Picture on LCD Monitor is not clear.

S2: Picture quality is not properly adjusted. Adjust picture quality. **(➔ 21)**

P3: Movie Camera is turned on but no picture appears in Finder.

S3: Power Save Functions have become activated. Hold Movie Camera again in horizontal position. Or set [APS] on the [MAIN MENU2] Menu to [OFF]. **(➔ 43)**

Recording (Continued)

P4: Recording does not start when pressing the Recording Start/Stop Button.

S4: The tab of the inserted cassette is broken out. Insert a cassette with intact tab. Or cover the hole where the tab was with two layers of adhesive tape. **(➔ 24)**

P5: The Date/Time/Title Indication is not displayed.

S5-1: This is due to incorrect operation of the [DATE/TITLE] Button and/or the [MENU] Button. Press the [MENU] Button and set the desired Date/Time/Title Indication. Then press the [DATE/TITLE] Button so that the Date/Time/Title Indication appears. **(➔ 28)**

S5-2: The built-in Lithium Battery is discharged. Charge it. **(➔ 29)**

Playback

P1: No playback picture is reproduced.

S1: The [POWER] Switch of the Movie Camera is not turned out. Turn it out and then press the [VCR/CAMERA] Button, so that the [VCR] Lamp lights. **(➔ 35)**

P2: The playback picture is distorted or contains noise bars.

S2-1: The tape in the cassette is loose. Tighten it. **(➔ 22)**

S2-2: The video heads are dirty. Clean them with an optional video head cleaning cassette. **(➔ 89)**

S2-3: The tracking is not adjusted correctly. Adjust the tracking correctly. **(➔ 40)**

P3: The playback picture is not in colour.

S3: The colour adjustment on the TV is not made properly. Adjust the colour control on the TV.

Remote Controller

P1: The Remote Controller does not work.

S1-1: The batteries in the Remote Controller are exhausted. Replace them with new "AAA", "UM-4" or "R03" type batteries. **(➔ 71)**

S1-2: The Remote Controller and/or the Movie Camera are exposed to strong light. Prevent strong light from falling on the Remote Controller and/or Movie Camera when using the Remote Controller.

Demonstration Mode

P1: The Movie Camera remains in the Demonstration Mode.

S1: The Demonstration Mode is designed for explaining the versatile functions of this Movie Camera. To switch this mode off, turn in the [POWER] Switch and then turn it out again while pressing the [STOP] Button. Or, set [DEMO MODE] on the [MAIN MENU2] Menu to [OFF]. **(➔ 96)**

A

Printed in Japan
VQT8038-1
S0399Y1069(1250 Ⓗ)
D

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan